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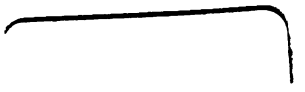

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BRITISH INDUSTRIES

A SERIES OF GENERAL REVIEWS
FOR BUSINESS MEN AND STUDENTS

EDITED BY
W. J. ASHLEY, M.A.
PROFESSOR OF COMMERCE IN THE UNIVERSITY OF BIRMINGHAM
LATE PROFESSOR IN HARVARD UNIVERSITY
SOMETIME FELLOW OF LINCOLN COLLEGE, OXFORD

SECOND EDITION

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PREFACE

THE ten lectures here printed were delivered during the winter of 1902–3 under the auspices of the University of Birmingham, and were designed for two classes of auditors. They were intended to supplement the instruction given by the permanent teachers to the students in the Faculty of Commerce; and it was hoped that they would also prove interesting and suggestive to men already in business. Similar motives have now led to their publication. Men of affairs will find information in them not easily accessible elsewhere; and those who are concerned in the administration of one particular trade may perhaps learn something from the arrangements and experiments of other branches of business. But the main object of the volume is to serve the purposes of students in the new Faculties and Departments of Commerce that are being created in our universities.

It is very clear that a training for commercial life is both desirable and possible, and that that training—for the men who are likely to occupy positions of control and large responsibility—should be of the highest intellectual type; that, in short, it should be, in the best sense of the phrase, "of a university type." But I feel very strongly that the problem how best to constitute such a course of training has not yet been adequately considered. It will not be enough, in my

opinion, to make a mere rearrangement of the studies already pursued in our colleges. New subjects will have to be introduced; and arduous explorations will have to be made, with new motives, in fields hitherto only hastily entered.

This last remark applies with especial force to Political Economy. I have often been asked, "What is the value of Political Economy to a young man going into business?" I have had to reply that it depended on the Political Economy. A student who took advantage of the opportunities offered by the wide range of courses of instruction given under the head of Political Economy in a great German or American university would, I think, gain much more than he could get from the limited body of argument and observation which passed until recently in England as Political Economy. I hasten to add that this limitation was naturally more marked in the ordinary academic instruction than in the writings of the few eminent economists we have been fortunate enough to possess; and I speak from no little experience of teaching and examining in Political Economy in institutions ancient and modern.

It is not necessary here to discuss either the essential adequacy or the educational value of the Political Economy of English university tradition. The point is that, be its value high or low, it needs supplementing. Even in Germany and America the circle of economic study needs to be enlarged in several directions, if the training is to be adapted to higher commercial education.

I will not try to explain here the way in which it needs supplementing in the case of students who have already undergone some intellectual discipline, and are mature enough to grapple with the difficult problems of business policy. It will be sufficient to indicate the

needs of the earlier and lower stages of university instruction. Surely no one will deny the desirability of giving students, before they settle down into the groove of one particular business or type of business, a general view of the main features of the industrial and commercial life of their own and other lands. To be able to conceive of their own particular occupation as occupying a definite place in the economic activity of their time, will add to its interest: the development of other industries will suggest possibilities in their own future work: and, of course, where circumstances leave them a certain freedom of choice as to their careers, they will exercise the choice more intelligently when they know something about the possible alternatives. Moreover, there is, I am sure, some educational advantage in seeking sometimes to reach the general principle through the concrete. I do not mean to raise the question of "deductive" or "inductive" method. I only want to urge that we have long enough pursued abstract lines of reasoning, and then looked round for practical "examples"; and that we might now, occasionally, begin with a concrete group of circumstances—a great industry, or a staple trade—and watch the generalizations (the "principles," if you like) emerging from the mass of particulars.

This little volume is meant as a modest contribution to the preliminary survey and description of English business life; toward that account of the external organization of trade which one may call "economic morphology." There is, I venture to think, a great deal in it that will serve this purpose. The lecturers are all of them authorities in their respective fields. But as they were left quite free, and it was possible, in the nature of the case, to indicate only in very general terms the ideal that floated before the university, the

lectures differ in their character very much from one another. But lectures which offer less in one direction offer sometimes more in others; and I must again thank the contributors for their most welcome assistance.

It will be observed that the lectures were all given before the fiscal controversy became acute. Some of the contributors will be found arguing on one side, some on the other. My own views have so lately been set forth in a little book on *The Tariff Problem*, that I have no excuse for further comment in this place. And it will be noticed, also, that one lecturer sometimes differs from another in his opinion on a particular topic. Thus what Mr. Jeans says about the prospects of trusts in Great Britain should be compared with Mr. Macrosty's account of the progress they have already made; and the last-named writer will be found to view the Shipping Conferences with other eyes than Dr. Ginsburg, and the Bradford Dyeing Board with other eyes than Mr. Hooper. But these divergences ought to set the student thinking. Comparison of the several lectures will be facilitated by the analytical table of contents. And although the hasty reviewer will be rejoiced to be able to notice the absence of an index, I beg leave to add that I think indexing has been a little overdone, and that preliminary analytical tables of contents will often be more useful to the serious student.

W. J. ASHLEY.

EDGBASTON,
September 28, 1903.

NOTE TO THE SECOND EDITION

THIS collection of papers has clearly done something to satisfy a want, both among students and in wider circles. In the universities it has been found of use as an introduction to that more "realistic" treatment of economic questions towards which they are all feeling their way. It is now reprinted in the belief that its modest size and wide range will enable it to serve that purpose for some time to come. Since its first appearance, however, there has been a welcome increase in the number of available treatises dealing with particular industries; and the reader who has obtained from these pages some general notions of the history and organization of a trade will do well to supplement his information by reference to later literature. On the subject of the first two lectures we can now turn to Mr. Jeans' "The Iron Trade of Great Britain" (1906); with which may advantageously be compared, both for further technical facts and also for the American point of view, Mr. H. H. Campbell's "The Manufacture and Properties of Iron and Steel" (1903). On textiles we have Professor S. J. Chapman's "The Lancashire Cotton Industry" (1904), and "The Cotton Industry and Trade" (1905); and also a brief but suggestive article by Professor J. H. Clapham on "Industrial Organization in the Woollen and Worsted Industries of Yorkshire" in the *Economic Journal* for December, 1906. Mr. Macrosty has continued his studies in capitalist combination, and has laid before us

an admirably arranged collection of material in his recent work, "The Trust Movement in British Industry" (1907). Dr. Arthur Shadwell's "Industrial Efficiency: A Comparative Study of Industrial Life in England, Germany and America" (2 vols. 1906), gives the impressions of an unusually competent observer, and clothes the dry bones of commercial statistics with the flesh of human interest. Finally, it must be added that the various "Reports of the Tariff Commission," whatever may be thought of the conclusions to which the Commission has arrived, certainly contain a vast mass of useful information, conveniently arranged for purposes of reference. There are separate Reports on "The Iron and Steel Trades" (1904), "The Woollen Industry" (1905), and "The Flax, Hemp, and Jute Industries" (1905). The student who wishes to penetrate into the manufacturing problems of Lancashire may consult also a "Reply to the Report of the Tariff Commission on the Cotton Industry," prepared for the Free Trade League by Professor Chapman (1905).

Readers of Mr. Jones' eloquent and weighty lecture will be interested to learn that a new sliding scale was adopted, after prolonged negotiations, by the Midland Iron and Steel Wages Board in June, 1906.

EDGBASTON,
May 25, 1907.

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BRITISH INDUSTRIES

THE BRITISH IRON AND STEEL INDUSTRIES: THEIR CONDITIONS AND OUTLOOK

J. Stephen Jeans

I

BEFORE proceeding to deal with the immediate subject of my lecture this evening, I would like to express my high sense of the importance of the movement inaugurated by the University of Birmingham in instituting the present series of lectures as a part of the course of the Faculty of Commerce. It has been made a reproach to England that her methods are antiquated, her ideas obsolete, her economic system exploded, and her whole business fabric permeated by principles as extinct, for all useful practical purposes, as the dodo or the megatherium. While far from subscribing to this view of the matter, I think it can hardly be gainsaid that in some matters we have fallen behind our rivals; and I can conceive of no means better calculated to redress the balance between us and them than that of a system of tuition or lectures which is designed to place before the students of to-day, and the business men of a few years hence, information as to the principles and

conditions of the industry and commerce of our own and other countries.

The iron and steel industries of this country, like other industries both here and elsewhere, depend for their success on certain conditions with which we are all familiar. The more fundamental of these conditions are, (1) the supply of suitable raw materials at a low cost; (2) the command of adequately skilled labour free from liability to exactions and restraint that are likely to interfere with its maximum efficiency; (3) a temperate climate, in which work can be carried on all through the year, practically unaffected by extremes of heat or cold; (4) a geographical position which facilitates easy and inexpensive access to the world's markets; (5) an energetic, enterprising, intelligent, and well-informed body of men in control of administrative arrangements; (6) an efficient system of economical transport; and (7) economic and fiscal systems that aid commercial expansion in all directions.

The iron industry of the British Isles held, for many years, an almost unchallenged position in regard to most of these conditions. Our industry is one of the oldest. Russia, Sweden, Germany, and France did, indeed, produce iron and steel in the earlier half of the eighteenth century in competition with ourselves. Some of these countries even exported iron to our own. The United States had also made a start with their iron manufacture in the latter half of the same century. To a large extent the leading countries of the world may be said to have had an even start about the year 1750. By the year 1800 our own country was a long way ahead of all the others. Fifty years later we were producing about one-half of all the iron and steel made throughout the world. From that time until about 1875 we practically continued to hold that paramount place.

But from 1875 other nations have rapidly come to the front. Germany may be said to have entered upon a new industrial career, in which the iron industry played a prominent part, after the Franco-German War. The United States were ten years later than Germany in achieving a really important position in the same race, and since 1885 our American cousins have made most of the running; until they now produce nearly one-half of both the iron and the steel manufactured throughout the globe, occupying, in this regard, the same relative position, but on a greatly extended scale of operations, that our own country did in the middle of the nineteenth century. France has made haste slowly, and now produces only one-third of the annual output of iron by Germany and our own country respectively. Austria-Hungary and Russia, which came much later into the field on anything like an extensive scale, are somewhat behind France in their annual yield. Belgium only produces one-half of the quantity of iron produced by France, and less than one-seventh of our own annual production, while Sweden produces little more than one-half the annual output of Belgium.

From this short review of the statistical position of the leading countries of the world in relation to the production of iron, it will be noted that great changes have taken place in their relative circumstances as iron producers. For us, however, the most important of these changes consists in the fact that we had at one time acquired a predominating position, which we have since then been unable to maintain, and that other countries are making much more rapid absolute progress than ourselves. What, then, are the conditions that gave England the lead in the iron industry, and what are the circumstances that have caused us to lose that lead? These are the two fundamental questions which

control and influence all others, and on which I may now proceed to offer some observations.

The leading place was secured to Great Britain by various circumstances, among which I should be disposed to place the enterprise of her own sons in the first place; the greater forwardness of the mechanical arts, among which I would include the railway system, in the second place; the command of a higher grade of artisan labour and industrial experience in the third place; and the more fully developed character of her resources in the fourth place. We are not likely to forget, although I would only touch the subject here very lightly, that most of the greatest inventions and discoveries that have established the foundations of the great iron industry of to-day have been of British origin—that Dudley, Cort, Rogers, Neilson, Bessemer, Thomas, and others have been British, while Siemens, though of German origin, was a naturalized Englishman. I cannot stay to dwell on the multitude of minor lights that illuminated the comparative darkness in which our metallurgy was enshrouded when our iron industry was passing through its most progressive period. Their number is legion, and never before have we had more capable scientific men seeking to settle the unsolved problems of the metallurgy of iron and steel than we have to-day. But a fundamental difference distinguishes the earlier from the later developments of this matter. A century ago, and indeed up to 1860, few contributions were made to the available stock of inventions of the first rank by any other country than our own, and it was but natural that this country should reap the reward of such pre-eminence and priority as she did. Of later stages in that progress, I shall have occasion to speak presently.

One other influence rendered exceptional, if not

commanding, aid to our own country in developing its iron industry. By the year 1850 our available supplies of raw materials had been pretty well ascertained, and more or less exploited. About that time the iron ore of the Cleveland district, the last of the great ore fields of Britain to be opened up, had been discovered, and was in process of development. The discoveries of British ores made since that time have been comparatively insignificant. We have opened up fields in Lincolnshire, Northampton, Leicestershire, Nottingham, and Oxfordshire! We have also found a good deal of ore not then dreamt of in North-West Lancashire and West Cumberland.

But in nearly all other countries their iron ore fields were entirely virgin half a century ago, and for the most part entirely unknown. In Germany no serious attempt was being made to work the important deposits of Alsace-Lorraine, which now form the staple of the supplies of that country. France had not developed, nor probably had thought of developing, the large deposits of Nancy and of the Meurthe-et-Moselle, which now furnish more than one-half of the total French iron production. More important than all else, the United States had not ascertained the extent, character, and possibilities of the vast deposits of iron ore in the five great ranges now comprised under the generic name of the Lake Superior region, and furnishing to-day the material for about three-fourths of the American pig-iron output of 17 million tons per annum. So far as the other iron-making nations are concerned, some of their deposits had, of course, been exploited and worked for many years. Notably those of Dannemora in Sweden, of Styria in Austria, and of Blagodat in Russia. But these sources were subject to large limitations, and were used in what would now be regarded as

almost homœopathic doses. The Styrian Erzberg, or the almost classic mines of Dannemora, would be well-nigh exhausted in a single year if worked on American lines. Their longevity has been promoted, if not entirely ensured, by the fact that they have been worked on a small scale—so small a scale that I can remember the time when the Alpine Montangesellschaft, which controls the Erzberg of Austria, used about thirty blast furnaces to accomplish the work that is now easily accomplished by three. This was the case when, in 1881, the Iron and Steel Institute, during my secretaryship, visited Styria.

The same remarks that have been applied to the discovery and application of iron ores, apply, *mutatis mutandis*, to the utilization of mineral fuel. In your own district Dud Dudley was the greatest pioneer in this direction. It was many years before England lost the benefit of the start which was definitely made in the second half of the eighteenth century. In the United States, coke was not applied to any extent in the iron industry until about the middle of the nineteenth century. In Germany and France, up to about the same period, charcoal iron was the chief product, although in this country the scarcity of fuel had practically compelled the abandonment of that branch of the trade more than a century earlier. The recent strides made by the American iron industry have coincided with the general adoption of coke for smelting, instead of the charcoal and anthracite coal formerly used. The fuel problem, I may here add, is one that threatens to become serious in this country within a measurable distance of time, and especially in Scotland and the North of England. Good and cheap coke are essential bases of the iron industry. Few countries have hitherto enjoyed the benefit of such supplies to the same extent as ourselves. In no other country has there been such a depletion of

the coal required for metallurgical coke : but it may be some satisfaction to reflect that while our supplies are probably nearer exhaustion than those of our greatest rivals, those rivals, like ourselves, will, within the next half-century, at the present rate of exhaustion, have probably more reason to be alarmed for their future than our own country has to-day. It is certain that no country can now be said to have supplies that are correctly described as inexhaustible. That word was much more fitly applied to many stores of iron ore when the world's production of pig-iron was under 6 or even under 10 million tons a year, as it was in the earlier half of the nineteenth century ; but now that the world's output of iron has risen to considerably over 40 million tons, involving the consumption of probably 130 to 140 million tons of ore annually, the word exhaustion has come to have a practical and an immediate import which it has never had before. Even the vast deposits of Lake Superior may have their duration measured by the span of a single generation, or two generations at the most.

The Pig-iron Industry.—We will now proceed to consider the geographical conditions and general economic situation of the British iron and steel industries. You are, of course, aware that there are in this country several districts engaged in the production of iron and steel, varying from Scotland in the north to Northampton in the south, and Glamorganshire in the west. In these districts there are 146 works and 587 blast furnaces. Of the blast furnaces not much more than one-half have on an average been in use for a good many years past. Those that have not been employed are, for the most part, old and dilapidated furnaces, which are of little or no value except as scrap. The maximum number of furnaces that can be used with commercial success at

any one time may be taken as 400, that being the average of the year 1900, when the conditions of trade stimulated production to the utmost.

Fifty years ago the supply of iron ore required for the purposes of the British iron industry was mainly obtained from the older iron-making centres of Scotland, South Staffordshire, South Wales, and South and West Yorkshire. These districts mainly furnished ores from the coal measures; and it was not a rare thing to see coal and ironstone being mined from the same mine. The ores, generally speaking, were poor in iron, and inferior in quality, having too much phosphorus to be suited for the manufacture of steel. The development of the Bessemer process of steel manufacture between 1860 and 1875, and of the open-hearth system between 1875 and the present time, has called for pig-iron free from these contaminations, except where, since the year 1880, the basic steel process developed by Mr. S. G. Thomas has been adopted. The first-fruits of the adoption of the steel manufacture on a large scale was an impulse to the mining of the pure ores of West Cumberland and North-West Lancashire. For a time those ores sufficed for the needs of the British steel trades; except in so far as exported Swedish bar-iron furnished the raw material of the Sheffield crucible steel industry, which, however, was never of much relative magnitude, and the utmost yield of which never probably exceeded 100,000 tons a year. Those works that were not situated conveniently to the iron ores of the West Coast, such as Dowlais, Ebbw Vale, Consett, etc., had to seek supplies elsewhere. At this juncture the Bilbao district in the north of Spain came to the rescue. Within the last twenty years our imports of iron ore from this district alone have advanced from only a few thousand tons to nearly 7 million tons a year. Thirty years ago

our pig-iron output of 6 million tons a year was virtually entirely the product of home ores. To-day, nearly one-half of our total product of iron is smelted from imported ores, which are drawn from more than thirty different countries, including some of our own colonies, but of which some three-fourths continues to be supplied by Spain. Meanwhile, great changes have also taken place in the sources of our home supplies of ore. The Cleveland district, first opened about 1850, has for the last twelve or fifteen years supplied more than a third of our total home output. The output of Scotland has fallen to only about a third, and that of Staffordshire and South and West Yorkshire to less than a fifth, of their former maximum; while South Wales has virtually dropped out of the home ore business entirely, and now lives entirely on imported ores. Of other districts that have come more prominently to the front during the last twenty years, Lincolnshire, Northamptonshire, Leicestershire, Oxfordshire, and Nottinghamshire are entitled to notice. These five districts, added to the Cleveland, now produce annually some 9 to 9½ million tons of ore of a cheap and low grade character, the percentage of iron ranging from 28 to 35, and the calcined material, as charged into the blast furnaces, ranging from 40 to 45 per cent. of iron.

The future of the British iron industry will, it need hardly be said, greatly depend on the extent to which it can command cheap and abundant raw materials, in the form of ores and fuel. It is apprehended by some authorities that our outlook is far from satisfactory in respect of both. Not that the supply is exhausted, but that its extent is uncertain and its quality tending to inferiority. The ores of the West Coast occur in veins or pockets, which have a habit of suddenly giving out when least expected. Some of the largest deposits in

West Cumberland have been practically exhausted. Others promise to yield a large output for a generation to come. Of such is the famous Hodbarrow mines, which have produce for many years an average of 350,000 to 400,000 tons annually, and on which an expenditure of £300,000 or more is now being undertaken with a view to mining under the estuary of the Duddon. It is understood, by the way, that this one company has for many years past paid from £30,000 to £40,000 a year in royalty rents to the Earl of Lonsdale; and parenthetically it may be added that the company has earned profits sufficient to pay an average dividend over the whole period of 30 to 40 per cent. On the West Coast explorations are continually being carried on for the purpose of discovering new supplies of ore, but with only a limited amount of success. No one knows, and hardly any one ventures even on a conjecture, as to the quantity of hematite ore still left unworked on the West Coast. The assumption that there may be as much ore left as has hitherto been worked is a purely conjectural one, and has no really sound foundation. It is not entirely reassuring to find that most of the leading companies in this district—the Barrow, Millom and Askam, Cammell's, and others—have taken steps to largely supplement their home sources of supply by imports of foreign ores, and that the total quantity of foreign ores brought into the district is now approaching one-half of the total consumption, whereas twelve years ago it was not 20 per cent. of the total, and twenty years ago it was practically nil.

So far as the Cleveland district and the other districts furnishing lias or kindred ores are concerned, there is a vast reserve still available, although the grade has for a number of years past been declining, and is likely to continue to do so. A short time ago, a member of the

well-known Pease family, in a letter to the *Iron and Coal Trades Review*, computed that the best ironstone in this region would be exhausted within sixteen or eighteen years, and the district, in so far as it depended on local ores, would then have to use the shale ironstone, which would mean dearer and lower-grade supplies. Nevertheless, the total quantity of ironstone left in the Cleveland hills is not likely to be exhausted within the next two generations, if ever exhaustion, in the true sense of the term, should overtake it. The problem of the future will be—At what cost can low-grade ores be worked at a profit in competition with the other ores then available? To this question no adequate reply is at present possible. Vast areas of ironstone-bearing lands in North Yorkshire have hardly as yet been exploited. Over a large part of the district, known to contain ironstone, although of low grade, no railway facilities have yet been provided. So large is the total area of ironstone lands, that the original reserve was computed, as far back as 1850, at between 4000 and 5000 million tons. Up to the present time the total quantity worked has been between 220 and 250 million tons. The greater bulk of the remainder will probably never defray the cost of working; but that is a question that must be judged in relation to other circumstances, of which at present it is only possible to form a very imperfect idea. As with the Cleveland district, so, *mutatis mutandis*, with the other iron-making districts between this neighbourhood of Birmingham and the banks of the Tees. So imperfectly known is the wealth of these districts, that only a few months ago I was asked to identify myself with an important iron-making enterprise which was primarily founded on the acquisition in Northamptonshire of a virgin field of ironstone, computed to contain 2½ million tons, and to be capable of being worked at two shillings per ton,

including royalty. I am afraid such cases are rare, however, and I have no doubt that they are likely to be much rarer in the future. As regards coke supplies, there is probably no reason to anticipate actual scarcity for half a century to come; but in fifty years from now, exhaustion must begin to be felt.

If I were asked to offer an opinion—it could hardly be more than an opinion—as to the district in this country that had the brightest promise for the future, I should hardly name that in which we are now met, although I am aware that cinder pig, made at several works in this neighbourhood, is among the cheapest products of British blast furnaces. All other things being equal, a manufacturing district that lies near to the sea, and close to important coalfields, has the greatest opportunities of doing a prosperous business. There are three such districts in this country—Cleveland, West Scotland, and South Wales. West Cumberland is near to the sea, but remote from suitable and adequate fuel supplies. The Cleveland district has probably the greatest combination of advantages. In some cases, the only transportation costs to be met in making Cleveland pig-iron is that of *2s. 6d.* per ton for coke, and *1s. 6d.* to *2s.* per ton for limestone. In South Wales the works are near to the coalfield, or upon it, and within a shilling haul of a port for their ores, while in one notable case the ores are shipped directly into the works. In Scotland, most of the blast furnaces are on the coalfields of Lanarkshire or Ayrshire, and have the command of cheap fuel, while they get foreign ores delivered at such works as Gartsherrie and Summerlee for less than one shilling per ton railway rate. In this unfortunate district of South Staffordshire the railway charges go far to kill the iron industry. While the three districts I have just named, and the West Coast as well,

can place their finished goods f.o.b. from one to two shillings per ton, it costs Staffordshire manufacturers from eight to eleven shillings per ton to get their goods to London and Liverpool, their principal markets.

Organization.—The organization of the British iron industry has, like that of all other industries, some characteristics of its own. In a large number of cases the makers of pig-iron are also owners of iron ore and coal mines, makers of coke, and manufacturers of finished iron or steel, or both. In some cases they also own their own railway lines, make their own plant to a greater or less extent, possess their own jetties or harbours, navigate their own ships, and carry on affiliated branches of business. But while there is a tendency to increase the ramifications of such a business so as to make it as far as possible self-contained and self-supporting, there is much less attempted in this direction in Great Britain than there is in the United States, where the individual manufacturers are, in a large number of cases, as self-contained as their country. Such firms as the U.S. Steel Corporation, Jones and Laughlins, the Illinois Steel Co., and others, not only mine their own raw materials, undertake its transport, convert it into pig-iron, and thence into steel girders, etc., but they also have a staff of skilled engineers and architects, who are prepared to submit plans for the structures in which the finished material is to be used, and to superintend their erection. In our own country, we now have several large firms ready to do the same in one branch only—naval architecture. Two of the leading firms in England begin with the mining of the coal and ore, and end with the building of the finished ship. Two others begin with the manufacture of the steel plates, bars, and angles, and end with the building of the merchant vessel and man-of-war. Generally speaking, however, this is a very

unusual conjunction of resources. The majority of the works engaged in pig-iron making in this country are pig-iron makers only, having to buy all their raw materials, and to sell their iron on the principal markets convenient to them, to be worked up by others in forge or foundry.

During recent years there has been a much more active demand for mining properties than there formerly was; mainly, I fancy, because of the recognition of their importance as a check on abnormally high values. In most of the iron-ore mining districts of this country the ore was originally mined by a totally different set of men or firms to that which used it in the making of iron. On the West Coast, for example, the largest mining properties, with only one exception, have been developed and carried on by men who had nothing to do with blast furnaces. It has been largely the same in the Cleveland district, where the well-known firm of Pease and Partners carry on some of the largest mines. So also with the districts of Northamptonshire, Lincolnshire, Leicestershire, and Notts, although in a less notable degree. The general idea now, however, prevalent, is that a well-regulated iron-making enterprise should have its own mines and quarries; and to guard against serious surprises this appears to be necessary. It was due to the fact of his having obtained so large a control of iron ores in the Lake Superior region, and of coal and coke in the famous Connellsville region, that Mr. Andrew Carnegie succeeded in obtaining for his properties from the United States Steel Corporation three or four times the sum that they had cost him.

Finished Iron.—I do not propose to occupy much of your time with an account of the finished iron industry. You will, no doubt, be aware, that up to less than half a century ago finished iron was practically the only

iron of commerce, except where pig-iron was used for foundry requirements. In those days the total output of steel throughout the world was less than a single American Bessemer works would now produce in a few months. That steel was of the crucible variety, and very costly, running up to £70 and £80 per ton, so that it had to be used sparingly. The Birmingham district was for many years one of the most important in the world in reference to range of variety of its products in finished iron. Time was when this district produced nearly a million tons annually of that material. To-day its output does not exceed 300,000 tons a year, and the total output of the kingdom, which at one time was about three million tons annually, is now reduced to about one million tons. It has long been prophesied that the finished iron industry would be entirely extinguished. Prophesies of this kind are usually entitled to very little consideration. At the same time the output has steadily fallen off within the last twenty years. Many small mills and forges in this immediate locality have been entirely dismantled; and I think I can recollect cases within the last two years where, in this very neighbourhood, plants of this description have been sold for little more than scrap value. Under these conditions, not much progress can be expected in the finished iron industry. Indeed, it is probably one of the strongest evidences of our conservative habits and ideas that this branch of the trade should have held its own so long and so well. When we remember that a ton of bar iron costs three or four times the labour and fuel to produce that is expended on a ton of bar steel, and that, even when it has been produced, it is a fibrous and heterogeneous material, having its strength mainly in one direction, while steel is a crystalline and homogeneous structure, having its strength equally in all

directions, and capable of taking the hardness of the diamond, or the proverbial toughness of leather at will, it does seem remarkable that steel, which costs no more to produce, should not have displaced wrought iron entirely many years ago. That it has not done so, is sufficient evidence that there is still a market, and, I am glad to think, a not inconsiderable one, left for the older products of Staffordshire. The works engaged in this industry are, however, generally of small extent. There are probably not more than two or three in the country that severally produce over 30,000 tons of finished iron per annum. The other chief producing centres are the Cleveland district and Scotland. The industry has become practically extinct in South Wales; and the old West Yorkshire iron trade, which formerly kept up the works of Bowling, Lowmoor, Farnley, and Monkbridge, is also, I fear, rapidly going to the wall.

Steel.—To this country belongs the credit of having originated and pioneered practically every important branch of the steel industry. Huntsman perfected the manufacture of crucible steel. Bessemer patented and perfected the pneumatic process of manufacture. Siemens, conjointly with a Frenchman, M. Martin, developed the manufacture of steel on the open hearth; and Thomas discovered and developed the process mainly used in this district for producing what is known as basic steel.

It was inevitable, under these circumstances, that the country should attain early pre-eminence in the steel industry. Between 1860 and 1870 Great Britain was the only country that produced Bessemer steel on a large scale. Between 1870 and 1880 we were practically the only country that produced open-hearth steel, except on an almost experimental scale. In those halcyon days we were sometimes exporting over a

million tons of steel a year. We had the American market at our feet. It was not until about 1880 that Germany made any headway against us. The competition of other countries hardly counted.

Between 1880 and 1890 the United States made good strides in the steel trade, and we lost our greatest market almost suddenly. This event put an end to the further development of the Bessemer process in Great Britain; and for the last fifteen or twenty years we have practically ceased to advance along Bessemer lines. There are still about a dozen Bessemer plants at work; but as a rule they are not so fully employed as they should be, largely because of the serious character of the rivalry now offered by continental Europe and the United States. The conditions of the Bessemer steel industry, indeed, have been such as to check enterprise or effort at serious improvement commensurate with that which has taken place in other countries. The best plants, nevertheless, are pretty well up-to-date; and, if they are not fully equal to those abroad, it is not due to the managers, but to their unfortunate environment. The total number of Bessemer converters still available in this country is about sixty-five. The largest annual output of ingots in the last ten years has been under 2 million tons. But with only eighty-one standard converters in the United States, they claim to have a total capacity of about 13 million tons annually, or about 160,000 tons per converter per annum.

During the last twenty years the steel process that has made most of the running, both in our own country and abroad, has been that of the open hearth, nearly two-thirds of the total output of steel in Great Britain to-day being produced by this method. The principal centres of the open-hearth steel trade are Scotland, the Cleveland district, and South Wales. In the two

former districts the steel product of open-hearth furnaces is mainly used for shipbuilding purposes, and takes the form of plates, bars, and angles. In these categories the annual output of the districts named is nearly 2 million tons a year. In South Wales the chief steel product by the same process takes the form of tin-plate bars, the raw material of the tin-plate manufacture, of which the estimated output is from 450,000 to 500,000 tons a year.

In South Staffordshire, North Wales, Derbyshire, and South and West Yorkshire, the output of open-hearth steel is much smaller and of a more miscellaneous character than that of the three principal districts already mentioned.

It will be noted that the open-hearth process has in this country, during recent years, not only overtaken, but shot far ahead of the Bessemer process, from a quantitative point of view. There is a widespread belief that the advance has been qualitative as well, and that, to quote the remark of a distinguished American metallurgist, the open hearth will attend the funeral of the Bessemer process. This view has been stated by recognized authorities in our own country, and among others by Sir Lowthian Bell. It is no part of my business to venture into the region of prophecy. I can only say that the Bessemer process continues to hold its own in Germany and in the United States, and that while in our country the output of open-hearth steel is now nearly double that of the Bessemer description, in these two countries the output of Bessemer steel in 1901 was about double that produced on the open hearth. I may add here that the cost of production does not much differ as between the two processes, and that it is generally admitted that the open hearth lends itself more readily than the Bessemer converter to the

production of a regular and reliable product of any range in respect of softness and ductility.

The total number of works in this country now engaged in the production of open-hearth steel is about a hundred. Of these some eighteen in the North of England and sixteen in Scotland are mainly engaged in producing shipbuilding steel. The total number of open-hearth furnaces erected in the kingdom is about five hundred. Of these a large number are not regularly employed ; especially those used in the manufacture of steel castings, and at works where armour plates, projectiles, tyres, axles, wheels, and other special products are fabricated. But in works where the furnaces can be run regularly, as in Scotland and Cleveland, it is probably not too much to claim that British practice is equal to anything in the world, excepting, perhaps, two or three of the most forward establishments on the other side of the Atlantic. Twenty years ago five-ton or ten-ton furnaces were the rule. Nowadays, however, forty-ton or fifty-ton furnaces are generally being built, and furnaces of even larger dimensions are likely in the future.

II

IN my first lecture I made an effort to place before you some of the historical, geographical, and statistical conditions of the British iron industry. I indicated the conditions essential to the successful prosecution of such an industry, and pointed out the early appreciation and application of those conditions in our own country, tending to create a rapid and large development of the British iron industry before other nations had done anything worth speaking of in the same direction. I further indicated the special circumstances in reference to resources, development, and branches of output, that distinguish the principal iron-making districts of Great Britain, with a view to enabling you to estimate, not only the present extent and character of their several contributions to our iron industry, but also their possibilities of development in the future.

The prosperity of the iron trade of this country does not, however, entirely depend on the extent and duration of its raw materials, or on the cheapness of its transport, or on its geographical situation, or on any other of the conditions already dealt with. It is also liable to be greatly influenced by the administrative ability and enterprise of its executive; by the skill, application, and industry of its workmen; and by the exceptional character of its economic system, which, in the opinion of not a few men engaged in the trade, places it at a disadvantage in relation to other countries. In a

word, success in the iron industry is a function of many subtle and complex conditions, which it is not always easy to analyze. Upon some of the more important of these I now proceed to speak.

Marketing and Distribution.—In the iron trade, as in all other branches of manufacture, the natural and necessary sequence of events is to assemble the materials, to produce the finished or semi-finished product, and to sell and distribute it in the most convenient and accessible markets. In this country the selling of the manufactured article is largely done by merchants and agents. The larger proportion of the whole is not sold from the works direct. Indeed, it is very much the custom to regard the sale and distribution of both iron and steel as a totally different business from its manufacture. Even in Glasgow, where there is probably a million and a half tons of pig-iron, 250,000 to 300,000 tons of finished iron, and over a million tons of steel handled annually, the distribution is chiefly provided for by merchants. Most of the larger English houses, however, have their own special agents and offices in London, through whom the greater part of their output is marketed. At the same time, the independent merchant is not thereby debarred from making contracts on exceptionally favourable terms ; and it often happens that a buyer can make better terms through a merchant than he can by buying direct from the works that produce the particular brand sought for. We all know that the suppression of the middleman has been a popular cry with manufacturers and economists, as well as with buyers, for generations ; but he will not be suppressed. The merchant usually has a better knowledge of the conditions affecting different markets than the producer. He comes more directly in contact with the buyer ; he knows better to whom credit can safely be given, and is prepared to

risk credits that the manufacturer would often refuse; he is well posted in railway and shipping rates and conditions, understands the peculiarities, practices, and requirements of particular markets, and has all other necessary commercial information, including freights and tariff duties, at his fingers' ends. On the whole, therefore, it is probable that the merchant will continue as hitherto to play a leading part in the principal industries of this country, the iron trade included.

Standing Charges.—In the iron trade, as in other branches of commerce, the costs of production are divisible under the heads of raw materials, labour, depreciation, and standing charges. The item of standing charges is usually the most elastic and difficult to regulate. The principal items included under this head are clerical charges, rates and taxes, interest on capital, agencies, advertising, and administration. It is of the utmost importance, in any branch of manufacture, that these charges should be spread over as large an output as possible. Obviously, the most effective method of keeping down standing charges is to keep a plant fully employed. If works are kept going full time during the whole twenty-four hours, the standing charges of interest, rates, taxes, etc., should be approximately one-half what they would be if the plant was kept going only twelve hours. Standing charges vary greatly according to the commodity and its production. In this country they are generally more per ton of product than in Germany or America, because the Germans and Americans make great efforts to run full time, and in order to do this they do not hesitate to sell their surplus in foreign markets at a very low figure.

Management and Opportunities.—As probably some of those who now hear me, and others who may read what has been said, would like to know what

opportunities the iron trade offers for a career, I will proceed to offer some remarks on the subject, which is undoubtedly a practical phase of importance to young men. There are quite a number of positions open to men of talent and industry in iron and steel works—perhaps more than in most other great industries. Beginning with the general managers of a large enterprise like that of Bolckow, Vaughan and Co., the Consett Company, the Dowlais Company, and concerns of similar rank, whose salaries usually range between £3500 and £5000 a year, there are numerous subordinate positions to be filled at salaries ranging from £500 to £2000 a year. Among these are assistant general manager, engineer, blast-furnace manager, steel-works manager, rolling-mill manager, sales agent, secretary, chief draughtsman, and mineral manager. The position of chief chemist is also a position of responsibility, although I fear that the chemist's lot is not a happy one in the matter of emolument.

Of general managers it is perhaps not too much to say that, like great poets, painters, and actors, they are born, and not made. A model general manager should be at once an engineer, a chemist, a metallurgist, and a successful administrator of men and affairs. He should be a capable correspondent, a financier, a bit of a lawyer, and a good witness; he should be able to rule both his workmen and his board of directors; should know when and how to apportion credit and blame; should possess the difficult art of fitting the right sort of men into all sorts of positions; and should always be able to present a satisfactory balance-sheet at the end of the year. There are but few men who are fortunate enough to be gifted with all these attributes, and others which I need hardly further enlarge on. Hence the general managers known to fame are few and far between. As types of

such men in the past I need only mention the late Mr. Menelaus of Dowlais, and the late Mr. Edward Williams of Middlesbro'. Of the men of to-day it would not become me to speak.'

A recent writer has declared that in the American iron industry "the retribution for errors in management is as great as are the rewards of success, and judgment has become the most highly prized and highly paid of human talents." Every manager and every director of ironworks' plant in the United States is fully aware of this fact. In the leading concerns, such as the Carnegie Steel Company, the man who commits errors of judgment is directly cashiered. The American principle of management appears to be that of Napoleon—that a blunder is worse than a crime. Several leading men in the Carnegie Steel Company have had to make way for others because they have committed what was probably so trivial an offence that it would be entirely overlooked here.

Usually all subordinate positions are filled up by the general manager, with or without previous consultation with his board of directors. The qualifications needed for the filling of those positions need hardly be discussed here. The description of the various places to be filled sufficiently suggests the experience and training needed to fill them. In all cases theoretical and technical knowledge should go hand-in-hand, and the man who knows the most, all other things being equal, is likely to come out nearest the top. The great technical colleges established within recent years at Birmingham, Sheffield, Leeds, Manchester, and other large centres of industry, provide abundant opportunities for the capable and hard-working student to qualify for the highest positions available in the iron and steel industries.

Relation of Employers and Employed.—I should not leave this subject without some reference to the labour question, but as that has to a large extent been dealt with in the lecture delivered here by my friend, Mr. Daniel Jones, my reference must be of the briefest.

You have already been informed of the happily friendly relations that prevail in the iron and steel industries of this country, owing to the establishment and successful working of boards of arbitration and conciliation. In no industry with which I am acquainted have such boards won greater triumphs over so long a period. This is no mere accident of the character of the work, which is exceedingly laborious, and taxes both the physical and the mental powers of the selected workmen to an unusual degree. We have within recent recollection had great labour conflicts in the United States, leading to riot and bloodshed. In both France and Germany labour disputes in the iron industry are not unknown. The immunity from any general strike of iron and steel workers which we have enjoyed in this country for a quarter of a century has been due partly to the prudence and sweet reasonableness of the employers, led by such men as Sir Benjamin Hingley, Sir David Dale, and Mr. William Whitwell, and partly to the strong common sense and wisdom in the past of such workmen's representatives as the late John Kane and Edward Trow, with both of whom I was well acquainted, and Mr. Aucott and Mr. Cox at the present day. I may here recall the fact that some two years ago, when summoned by Mr. Ritchie, then the President of the Board of Trade, to attend a private conference to consider the most likely and successful means of bringing employers and employed into more harmonious relations, I had much satisfaction in bearing my testimony to the exceptionally friendly and harmonious

character of the relations prevailing in the iron and steel industries. The exact words I used, when Mr. Ritchie had unfolded his plans, were that so far as the iron trade was concerned, he was preaching to the converted. No one can doubt that these amicable relations have done much to assist the iron industry of this country to pass through periods of great stress and strain.

Geographical Position and Shipping Facilities.—In one respect Great Britain is, or at any rate should be, the most favoured nation in the world for carrying on a foreign trade. We have an unique command of shipping ports and of shipping resources. All other things being equal, this consideration alone should almost settle the race for commercial supremacy in our favour. While Germany has only Hamburg and Bremen, Belgium only Antwerp, France only Marseilles, Havre, Brest, and one or two others, Italy only Genoa, Naples, and Palermo, among ports of the front rank, we have in this country more than fifty ports whence shipments can be made, and ten to twenty ports of the first importance. Even the United States, with its enormous seaboard, cannot compete with England in respect of port and harbour facilities; for on the Atlantic seaboard the only ports that can be described as first-class are New York, Baltimore, Boston, Philadelphia, Pensacola, and Galveston. Another splendid endowment of British commerce is the comparatively short distances that separate our centres of manufacture from the sea. In the United States the chief centres of the iron industry are, in the order of their comparative importance, Pittsburg, which is 460 miles from the sea; Chicago, which is 950 miles; Cleveland, which is over a thousand miles; and Philadelphia, which is not more than 100 miles from the sea. The Quaker city, however, is hardly an iron trade centre in the sense in which the

other cities are, although important steel works are carried on at Pencoyd, Midvale, and Lukens, all within a few miles of Philadelphia. In this country, as I need hardly point out, there is no centre of the iron or of any other industry more than 60 to 80 miles from a port. The district of which Birmingham is the centre is farther than any other, but even here there is a choice between Bristol, Gloucester, Liverpool, and London. The natural advantages of the British islands are altogether exceptional. Those advantages, unfortunately, are neutralized by artificial conditions, such as exceptionally high railway rates and charges, heavy port charges, and shipping rings and conferences, which compel manufacturers to sacrifice much of the advantage which they should have in respect of topographical and geographical conditions.

Protection v. *Free Trade.*—The British iron industry differs from that of every other iron-making nation, except Sweden, in respect of being carried on under a system of free trade. This is a fact that dominates the whole situation, alike in respect of home and of foreign trade. It is therefore of the utmost importance that its significance should be understood by those who propose to go into the business, and by those who are already in it. The commanding importance of having control of home markets needs not to be insisted on. Only a few days ago I had an interesting letter from Mr. A. Carnegie, in which he used the following words :—

"I am dead sure about one thing : give me the big home markets, and surplus will take care of foreign orders, if ever, unfortunately, needed. Foreign trade is poor at best."

This view of the case has not hitherto been generally entertained in this country, but when we remember that the home markets absorb by far the largest part of the

output of the different iron-making countries, ranging from 65 to 98 per cent., there is much to be said for Mr. Carnegie's proposition.

It is comparatively an easy matter to guarantee the possession of home markets to the home producers of countries that have a high-tariff system. It is a totally different matter in countries like our own, with a free-trade system. Under high protection, the foreigner may be, and sometimes is, entirely shut out, and prices are determined entirely by home conditions. Under free trade the foreigner is admitted without let or hindrance; and it is the price at which he is prepared to sell that often determines the price at which the home producer *must* sell, and the profit which the home producer is allowed to make. This being so, it is conceivable that a country like our own may have the most magnificent natural resources, the most highly skilled workmen, the most capable and enterprising administration, the most up-to-date and economical plants, the most admirable and reasonable systems of transport, and yet be unable to compete with countries differently placed in all these matters, either in our own or foreign markets. In other words, success in such circumstances is not necessarily a function of either resources or deserts. You will ask why this should be so, and you are entitled to a reply.

In most protectionist countries arrangements are in force whereby the prices of iron and steel are regulated by syndicates, or so-called "cartels;" and they may be fixed at any level that the producer may determine, within the limits permitted by the tariff. Practically, in the United States, it is the decision of the Steel Corporation that governs the prices of iron ore, coke, pig-iron, and finished products. In Germany prices are similarly governed by syndicates in every important branch of the iron industry. In Austria-Hungary the

cartel system of uniform regulated prices has recently been applied to practically every iron manufacturing concern in the country. The same system is in operation in France and other iron-making countries. In effect, therefore, it may be said that the prices of iron and steel are subject to the control of the producers in every country except our own. Here they are subject to such control only as foreign competition will permit.

While, therefore, foreign countries can always, subject to the limitations imposed by their respective tariffs, raise or lower prices at will to their home consumers, this country has no such liberty, but must be content with the prices determined by the surpluses which competitive countries like Germany and the United States dump on our shores, in order to keep their industries fully occupied. This principle has been carried so far, that some two or three years ago it was admitted in Germany that in one important case the loss made by selling surplus abroad—mainly in British markets—was almost as large as the profit realized by sales in the German home markets. Quite recently an organization by German manufacturers is supposed to have entered into a compact to reimburse the losses of those of their number who ship iron and steel to this country at less than the cost of production. In the recent Report of the British Iron Trade Commission on American Industrial Conditions and Competition, I give a number of examples of the same thing being done by American manufacturers, showing differences of 60 to 90 per cent. against the home consumer, and in favour of the foreigner. No secret, indeed, is made of the fact that surplus, so-called, is to be disposed of at any price it will bring, irrespective of the cost of production.

Now let us consider for a moment where this situation may land us. The present capacity of the

blast furnaces of the United States is about twenty-five million tons. The output of pig-iron this year may be eighteen million tons. But when the inevitable slump comes, the home demand may, and probably will, fall to nine or ten million tons, a figure not unknown within the last five years. Suppose that the Americans with a home demand of ten million tons produced eighteen million tons of pig-iron, they would have a surplus of eight million tons to send abroad. The most vulnerable market in the world of any size is our own. Hence the bulk of this quantity would probably be shipped to England. If so, is it not clear that it would entirely swamp our home markets, and cause demoralization of prices and everything else? And this might happen quite apart from the economic conditions of the British iron industry in other respects.

Next to the extent and character of our iron ore supplies, this appears to me to be the most important question that now perplexes the British iron industry.

Home and Foreign Markets.—In considering the outlook for Great Britain, one cannot overlook the fact that while countries like the United States, with a home market of large extent practically secured to them by a high tariff wall, have opportunities for the disposal of their surpluses all over the world, this country has neither home nor foreign markets that can be absolutely relied on, except within very narrow limits. Hence the American, and to a large extent the German manufacturer, can depend upon marketing his product within much wider limits of demand than his British compeer. Some friends of my own have only one reply to make to those who suggest lack of enterprise and apparent contentment with small yields,—there is no market to rely on that would justify our producers of iron and steel in following American lines. This is no doubt true—

with reservations. There is no obvious reason why, if we are to make iron at all, we should not make it under the best and most economical conditions possible to us. We could hardly lose anything if we raised the productiveness of our plants, reduced the number of hands employed for a given output of iron or steel, and got a larger annual production per unit of capital invested. I cannot justify British pig-iron makers in only getting an average annual output of about 25,000 tons per furnace, while the American average is 61,000 tons, and the average of the bituminous furnaces only is about 79,000 tons. As with blast furnaces, so with Bessemer converters and open-hearth furnaces. The American efficiency is much larger than our own.

Royalties.—It has been asserted by some writers that one main reason of the relative decline of the British iron industry is the existence in this country of a system of high royalty rents, which compare unfavourably with the kindred circumstances of other countries. This is a more or less incorrect view of the case—at the most it is only half a truth. It is perfectly true that the cases in which minerals are worked free from royalty rents are comparatively few, but that is only because those who work the minerals have only in comparatively few cases taken steps to secure the freehold. The royalties paid in respect of most minerals worked under the same and similar conditions are quite as high in the United States as in this country, with very few exceptions. The coal royalties are lower than here, but so also is the price of coal. A Royal Commission sat on this question a number of years ago, and presented some interesting conclusions as to the amount of royalties paid on the working of British minerals. The most important of these conclusions was that the average British iron ore royalty was about 9*d.* per ton, while the average coal

royalty was taken at about 5*d.* per ton. These figures, calculated on the British output of iron ores and coal in 1901, would give a total royalty payment of about £4,600,000 for coal, and £450,000 for iron ores, or a total for both descriptions of mineral of £5,050,000. In addition to this, there is a considerable, though relatively insignificant, payment on both minerals in respect of way-leaves—that is to say, the liberty to move mineral traffic over another person's land in order to reach a railway line or a shipping port—which was given as about £202,000 for coal, and £14,781 for iron ores. I am not aware that any responsible person has attempted to argue that these charges should be cancelled. Of the "irresponsible chatter of frivolity" we are not called on to take any notice in this connection. The mining system of this country has been the outcome of complete freedom of contract, without either state control or intervention being exercised on either party to the contract; and it has, in my opinion, been quite correctly argued that almost, if not quite all, the important charges advanced against our royalty system rest ultimately upon a fundamental misapprehension of the true nature, determinants, and evidence of the system, and that when its true nature is understood, its possible effects either on prices or on wages must be infinitesimal. In times of extreme trade depression, various proposals have been put forward by mine-owners with a view to reducing the burden of royalties, but when trade is ordinarily good the burden is hardly felt. On the West Coast, where the royalty rent is the highest, following the value of the ore, most of the mines now work under a sliding-scale system, which regulates the royalty according to the ascertained selling price of the ore.

Trusts and Syndicates.—It will naturally be expected that I should say something as to the influence of

combinations of capital, ordinarily and briefly described as Trusts, on the present position and future outlook of the British iron industry. This expectation is the more natural now that the whole iron industry of Germany is regulated by trusts, using that term in its generic sense, while most other European countries have applied the trust principle in one form or another, and the United States have, in the Steel Corporation, applied it on the greatest scale of all. Trusts have been taken to mean manufacturing corporations with such great capital and power that they are at least thought by the public to have become a menace to their welfare. We need only discuss this aspect of the case in so far as it is affecting, or is likely to affect, our own iron industry.

There are two ways in which the Trust system of the United States, as typified by the Steel Corporation, may prejudicially affect the trade of this country. It may, in order to fight its home rivals and competitors, reduce prices to a point at which they find it difficult to live; and, in doing so, it would bring prices so much below those at which we in this country could hope to manufacture with a profit that the American invasion would then have come in real earnest. Or it may keep up prices in the United States, which it is likely to attempt to do, and probably can succeed in doing, whether the American demand is good or bad; but failing a large home demand, it may deluge Europe with iron and steel at prices with which European countries could not hope to compete, and which would, of course, be much under the more or less regulated and artificially high prices charged to home consumers. On the other hand, it is quite possible that the Corporation may use its power to keep up both home and foreign prices, in so far as they cultivate foreign trade at all—and that both for the sake of maintaining the high profits needed

to meet their obligations, and for the sake of conciliating home consumers, who could not be expected to regard with equanimity the prospect of having to keep alive organizations of this kind by paying much higher prices for their products than those paid by foreigners. This is an aspect of the case with which Americans themselves are certain to deal before very long, if President Roosevelt can manage it. That masterful, and, I believe, incorruptible man, has recently declared himself to be in favour of regulating the trusts ; and we may depend upon it that one of the conditions of such regulation will be the obligation to give the American consumers fair play, which they certainly could not be said to have if the Corporation sold their products cheaper in foreign than in home markets. On the whole, therefore, I cannot say that I am greatly scared as to the future of prices, as affected by American trust influences. It is clearly the interest of the Steel Corporation to keep up prices at home, and it is almost equally clearly their interest not to incur public resentment and risk probable adverse legislation, by cultivating foreign markets at the expense of home consumers. So far as Continental trusts are concerned, those of Germany have probably not done us so much harm as is generally supposed. Attempts have been made for some time past to establish an organization described as an Abrechnungsstelle, which is designed to reimburse German ironmasters and steel manufacturers for the losses incurred in selling under cost price in foreign markets, but that is not yet an accomplished fact. The German manufacturers are divided into two distinct, and more or less antagonistic, categories—the first, those who both make pig-iron and manufacture steel blooms and billets for sale ; and the second, those who do not make pig-iron, but buy their blooms and billets, and work them up into more finished

products. The former group have for the last two years been selling blooms and billets in this country at lower prices than they have sold to the second group. This system has rendered it extremely difficult for the second group to sell in the German home market, and has made it almost impossible for them to cultivate foreign markets, because they could only do so at a loss, which their possible profits would not enable them to recoup. There are, therefore, obvious limitations even to the German invasion of British markets; and unless conditions radically change in Germany itself, I hardly think that the severe competition from which we have suffered in the last two years may be expected to continue its severity. This, however, is little more than a pious opinion, and is not put forward as a prophecy. The iron trade is full of surprises; and no man's opinion as to its future can be much more than a mere conjecture.

Much has been said at different times as to the possible extension of the Trust system—using that term in its evident or generic sense—in our own country. It does not seem to me that here the system could be applied with advantage to producers, and certainly not with any possible gain to consumers. The main reason for this fact is that while in protectionist countries prices may be regulated by such combinations within tolerably wide limits, here prices must be largely determined by the behaviour of the foreigner. An arrangement made to-day to sell at a certain regulated price may be completely upset to-morrow by the action of an outside country. Although the output of iron and steel throughout the world is now so enormous, the iron market is so sensitive that an offer of 25,000 or 50,000 tons of pig-iron or steel in markets like Glasgow and Middlesbro', at 5*s.* or 10*s.* below current prices, would completely demoralize the market, and almost create a panic. It

is difficult under these circumstances to see what benefit the extension of the Trust system in this country could be expected to confer in the way of keeping markets from falling to pieces. It might, no doubt, under certain conditions, aid in the cheapening of production by reducing standing charges, and enabling manufacturers to keep their most economical plants fully employed while closing those that were unprofitable. But Disraeli once truly remarked that England does not love coalitions, and unless I greatly err, we do not love them any more in the manufacturing than in the political sphere.

I have now brought my lecture to a close. I feel that I have only touched the fringe of a great subject. There are many single aspects of the iron industry of this country that would alone require very much more time and space to do them the barest meed of justice than I have been able to devote to the whole matter. But I have tried in what I have submitted to lead your minds to the consideration of questions that are deserving of further thought, and with respect to which I venture to believe further attention is likely to be rewarded by valuable insight into industrial conditions and economic law, which, applied in everyday practice, should lead to fruitful results. I have been compelled by the exigencies of time to leave many subjects untouched that have a most intimate, nay, even a fundamental, bearing on the prosperity of the iron industry. Of such are the great questions of railroad transportation, to which this Faculty should devote all the attention it possibly can, seeing that it underlies the whole superstructure of successful manufacture; that of piece-work; that of apprentice labour; and that of sliding scales as applied to raw materials, and as applied also to railway rates and charges, and to labour. The large subject of the fields of iron ore available for the British iron

industry in Spain, Sweden, Norway, and other countries, I have only barely glanced at. The technology of the trade I have left entirely untouched. If such lectures, or their equivalents, should be proceeded with in the future, it would, no doubt, be worth consideration how far these and kindred subjects should be embraced within their scope. Let me conclude with an expression of my firm belief that whatever clouds may appear to lower over the British iron industry either now or in the future, there never will come a time when our great natural advantages can fail to count for much in our favour. Nor can I believe that we are ever likely to see the day when the qualities of inventiveness, energy, enterprise, and capacity for seizing opportunities, which have made England great, will not, if continued and adapted to modern conditions, keep us well to the front as a manufacturing nation, and not least so among the nations that manufacture iron and steel. Many of the conditions to which I have referred to-night, apparently so adverse at present, are also so artificial that they may at any time disappear. This should be an encouragement to us to do our utmost, even in the face of what may appear to be overwhelming odds, and not to weary in well-doing, believing that in due time we shall reap our reward.

THE MIDLAND IRON AND STEEL WAGES BOARD

Daniel Jones

MY task to-night is simply to lay before you the inner working of the Midland Iron and Steel Wages Board, upon the ground that amidst all the labour troubles for the last thirty years our methods of treating the relations of employers and their operatives has proved successful, not a single strike having occurred during that time. The public read in the newspapers accounts given by each side of the contending parties in a strike, and lament over the warfare, but few go thoughtfully into the subject and treat it as a study. Professor Ashley informs me that there are present to-night a number of young students as well as the public.

This is perhaps the first lecture which has been addressed to young students by way of instruction on the subject of Conciliation and Arbitration, and they will ask why they should be addressed on such a subject. The answer is that those who are going through a course of training under the Faculty of Commerce in this University of Birmingham, including a technical education, will probably sooner or later have to deal with working men, and then will be brought into contact with one of the most important problems of the day—"The Labour Question," as it is called.

We want their minds to be habituated to a train of thought on the line of conduct towards, and treatment of, those who will be acting as working men under their direction. This will lead them, when the time comes, to be prepared for dealing with this "Labour Question," and their relation to the working classes as their employers or overseers, in the way most approved of in this country as the result of some thirty years of experience. Without some preparation and knowledge of the subject they cannot expect to assume such positions without falling into error, and will have discovered their mistakes only after mischief has been done.

The adoption in most of the trades in the country of the principles of Conciliation and Arbitration, in one form or another, shows a concensus of opinion that it is the right and the best method of adjusting the relations of Capital and Labour. You will find a list of Conciliation and Arbitration Boards and Joint Committees in the "Directory of Industrial Associations in the United Kingdom," issued by the Labour Department of the Board of Trade.

The history of Labour is far too lengthy a subject to treat of here. It is sufficient to know that workmen engaged in similar employments, and aggregated together in the towns, as they mostly were in the Middle Ages, formed societies for mutual help and protection. We can trace them back as far as the thirteenth century. When the invention of the steam engine and the construction of railways and canals enabled us to develop our mines and manufactures, huge populations of working men sprang up in various centres, and these became more or less subject to organization. These organizations, which developed into the modern form of Trades Unions, necessitated the adoption of some reasonable way of settling, not only rates of wages, but every other matter

of dispute which might arise between the employer and his operatives. (I have always chosen the word operative in preference to that of employee, as I have constantly found, with careless writing, employer is read employee, and *vice versa*.)

Thus arose the establishment of Boards of Conciliation and Arbitration. They were the necessary sequence of organized labour, and, moreover, without such organization they could not be carried on, at least under the rules of our Midland Iron and Steel Wages Board.

Some of these Boards existed in a very simple form, and one of the first was organized in the carpet trade. The late Right Hon. A. J. Mundella had applied the principle of conciliation to the hosiery and glove trades of Nottingham, Derby, and North Leicestershire. The subject was brought before meetings of the Associated Chambers of Commerce in 1865, 1866, and 1867.

In 1866 a serious contest arose between the iron manufacturers of the North of England and their workmen, which laid idle the whole of the works for six months. Sir David Dale (then Mr. D. Dale) applied himself to the establishment of the North of England Board of Conciliation and Arbitration, which was finally matured in February, 1869.

This is, in my opinion, a typical Conciliation Board; and it is upon this foundation that the Midland Iron and Steel Wages Board has been organized, though with some modifications to adapt it to the circumstances of the districts over which it rules. For it not only deals with South Staffordshire; it reaches also North Staffordshire, Shropshire, Lancashire, South Yorkshire, and Derbyshire; and it has a branch committee in South Wales.

I cannot here enter into the details I should desire

of the formation of this North of England Board. They will be found in the address of Sir David Dale, delivered at the Leeds Industrial Conference in 1899, and published in pamphlet form, entitled "Thirty Years' Experience of Industrial Conciliation and Arbitration." It may be obtained at the Central Offices of the Labour Association, 15, Southampton Row, Holborn, London, W.C.

Before I proceed to describe the machinery and working of our Midland Iron and Steel Wages Board, by which strikes, lockouts, and conflicts are avoided, I must hold up before you a picture of the sufferings which were the consequences of such events. You of to-day may thank God that they do not happen in your time.

The cessation of work may be caused by a "strike" or a "lockout." Whatever the subject of contention is, the question of "strike" or "lockout" is determined by the cessation of work, whether it is caused by the employer closing his works, which constitutes a "lockout," or the operatives ceasing to continue their work, which establishes a "strike."

Such cessations from work under the old conditions, before thorough Trades Union organization, found the workmen without any accumulated fund to fall back on for relief; the result was that at an early stage household goods, furniture, and clothing were sold or pawned. Scant food and fireless grates followed. Groups of workmen scoured the countryside, begging from door to door, with faces gaunt, sullen, pallid and pinched, with sunken eyes and the stare of hopeless dejection, or with compressed lips and the savage glare of resentment. The women were left at home foodless, pale and wan, and broken-hearted at the cries of their hungry, unfed children. Even *their* determination to back their husbands' cause failed through sheer despair.

Then the workhouses were filled, and as the hardships increased the spirit of hatred and bitterness towards the employer grew. Public sympathy for the defenceless women and children was aroused, and the tender-hearted gave what they could, irrespective of the merits of the matter in dispute. Sickness and mortality raised their fiendish heads. In desperation, rioting commenced, the yeomanry were called out, and the sequel was brought about in the return to work.

This was hard enough when it was the act of the operatives, who *commenced* the strike. Should, however, the works be closed by the act of the employer, and the operatives were "locked out," which I must say was very rarely the case, the sufferings I have described were re-enacted, but the sense of injury and spirit of bitterness amongst the men were intensified. If the operatives were defeated, they nursed revenge, and sought for the first opportunity of renewing the struggle.

The monetary loss on both sides was often most serious, and weak employers were brought to bankruptcy. Nor could the blame be laid *particularly* to one side or the other, for there were probably good and sufficient reasons for what was being claimed; but the folly and wickedness lay in their not coming together to discuss their affairs and respective difficulties, as ordinary men of business.

This state of things was not only the cause of loss to each side, but to the nation. It was so contrary to reason and common sense, to say nothing of the abandonment of all religious and moral principles that the position became unendurable. Was it an edifying picture to be held up before a nation which prides itself on its wealth, intellect, culture, religion, and professes to be the pioneer of civilization?

It is indeed strange that, although our ablest thinkers, the best of our philanthropists, those deeply interested pecuniarily, and the members of our Legislature, have sought for methods to cure the evil, it was not until about the year 1865 that Conciliation and Arbitration were found to be the remedy; and even then, and for some years, the progress was very slow. Some people have thought Arbitration only would meet the case. It might be a means of *settling* a difficulty which had arisen, but it did not *prevent* it. It had none of the educational features of an organized Wages Board. A workman was not likely to be selected as arbitrator by the employers, and an employer would generally be rejected by the workmen, both being interested parties and under an unfair bias. There are, it is true, at least two noteworthy exceptions in Sir David Dale in the North of England, and Sir Benjamin Hingley in the Midlands, both of whom have acted as arbitrators in matters connected with their own trade; and it is a good illustration of the confidence which is begotten of the inner working of Wages Boards, they have both been Chairmen of such Boards, and have thus won the confidence of the operatives.

Arbitration was often resorted to *after* the mischief had been done. The arbitrator was sometimes the mayor of a town, a County Court judge, a barrister, and occasionally a nobleman has been appointed—some one who was a disinterested person, but thought to have the experience and capacity for weighing evidence. He was not *permanent* in his appointment. He knew nothing of the technicalities or details of the trade he was dealing with. The evidence was not always supported by figures and accurate data, because where there are no regularly constituted Boards, accurate figures and statistics spread over a lengthened period

are not available. The extracting of figures from the books of the employers by an accountant, unless they extend over a long period, are sometimes misleading, and those are the only figures an arbitrator can get before him. The arbitrator may be swayed by sympathy with the poverty and sufferings of the work-people and their families during a long strike, which have been constantly held up before the public in the newspapers, and there is certainly a tendency in most men of noble and generous natures to lean towards the weaker side.

Here let me draw a distinction between an arbitrator called in for a special occasion and the man who holds the position of president of a Wages Board, of whom we shall speak presently.

He, too, is an arbitrator, but he is *permanently* appointed. He has constantly before him all the acts and decisions of the Standing Committee and other settlements. He has for his guidance all the minutes, figures, and evidence produced at continuous meetings of the committee for the settlement of disputes or fixing wages. If he is not in the trade, he acquires some knowledge of its technicalities. He has a wide area of past information upon which to base some general principles, and in such a case there can be no objection to an arbitrator, *i.e.* as a *permanent* official of a Wages Board.

Of later years there has been shown greater confidence in Conciliation Boards; and in London, as well as in many of the larger towns, Municipal Conciliation Boards have been established. Another form of conciliation is at work under the powers of the Conciliation (Trades Disputes) Act of 1896.

I believe the spirit of conciliation which has been manifest of late years is largely due to the success of

the North of England and the Midland Boards, but there is a broad difference between the first-mentioned class of Boards and the two I have last mentioned, and we shall speak of that difference when we come to treat of organization.

The establishment of a Wages Board ought not to be to-day so difficult as it was thirty years ago, when the scheme was new and untried. You then had to deal with an Operatives' Secretary, who was secretary of a Trades Union, a man who had been denied access to the employers, one who had looked upon the employer as his natural enemy, with interests diametrically opposed to those of his class. His attitude up to that time had been one of constant conflict with the employer. His salary was paid by the union, and he had to maintain his popularity and situation by appearing to be *fighting* in the interests of the workmen—not by conciliating; that would have been an evidence of his unfitness for his post in the eyes of the union.

It was a difficult task for the Employers' Secretary to win the confidence and respect of that man, and more difficult still for the employers to gain his confidence and that of the thousands behind him. It was difficult for him to learn new ideas and standards of action, to induce him to abandon cunning and cleverness in favour of honesty, justice, and wisdom. Hitherto he had seen many cases of imposition upon the men and of unfair treatment; he had been brought up to view his employer and manager as necessarily his enemies; and yet, if he were to do any good on a Wages Board, he had to learn and teach others how much the interests of employers and operatives are linked together; he had to give his confidence to those he had doubted, and win their confidence in return by his truthful, upright, and consistent conduct, in favour of what is right, though

pressed to the utmost by the mass behind him. Think of the change required, and realize how slow must have been the progress, especially if there had been even one ungenuine employer on the committee.

Such is not the case to-day. The lessons have been learnt, and we have Operatives' Secretaries as honest, upright, truthful, and intelligent as can be found in any class of life. When they pass away, there are well-trained members in the Operatives' Section of the Boards who will take their places and act upon their principles. They will have laid a foundation upon which future generations will maintain the fabric which has been reared upon it.

Then the employers were not unanimous in adopting the principle; it hadn't been tried sufficiently to prove its efficiency. Some looked upon it as Utopian, and a surrender of their previous attitude, and they refused to meet a delegate or secretary who was not one of their own workmen. It was thought to be a recognition of the union, and consequently dangerous.

All this is changed, and it is recognized that large bodies of workmen engaged in the same trade must be dealt with as a class, and not individually. Thus the organization of a union of workmen is essential to the working of a Wages Board, and in the Midland iron and steel trade the employers encourage their workmen to belong to the union.

The essence of success in the working of a Wages Board is to be found in far-reaching organization. Every workman engaged in the trade under its rules should be a member. The workmen following the several occupations in that trade must not be looking to other organizations which represent their own sectional employments. The Wages Board is not to be the instrument of several other organizations, as, for

instance, boiler-makers, engine and crane men, or what not. It is the machinery for settling the industrial affairs of every individual operative, acting in the several works. The workman must look to his Wages Board as his protector, and must be loyal to it. If representatives and secretaries of other subsidiary organizations were to be members of the Standing Committee, the Board would become unworkable. Each association would be acting from its own standpoint, and approach the Standing Committee of which they would be members with a preconceived idea of carrying out their separate policies; and the result would be a clashing of interests, instead of fair judgment with an open mind and the determination to be guided by the evidence submitted to it.

Attempts have been made in the Midlands, and still more frequently in the North of England, to engraft these subordinate associations upon the parent Board, but it is essential to the existence of a Wages Board that they should not succeed.

Membership of the Board is evinced by each paying a small sum quarterly towards its maintenance. Surely it is worth something to a workman to have a tribunal before which any grievance can be brought; which provides means for adjusting wages without the need of striking; for fixing a fair rate of wages when new processes are introduced, or when the conditions of labour are altered; a means of protection from unreasonable managers; the assurance of uninterrupted employment; a tribunal better than the police court for dealing with aggravated cases; to have a friend at hand in the Operatives' Works Representative, with whom he can confer in a difficulty; and to know that his welfare is to be ruled by common sense rather than by temper. The payments for these services are not onerous. Tonnage

men are asked to pay *4d.* per quarter, and day men receiving under *3s. 6d.* a day *2d.* per quarter—not a very extravagant charge for the services rendered.

Every employer in the districts ruled by the Board should be a member, as the advantages are so obvious. Their works are kept going and the output maintained; general charges are kept down, interest on capital covered, waste—especially of fuel in the iron trade—avoided; escape from trouble and anxiety in having a committee to whom *any* question can be referred; the regular announcement bimonthly of the rate of wages; and the maintenance of good relationship with their operatives. Moreover, it has been distinctly stated by the Operatives' Section of the Board that they will facilitate the adoption of new and improved machinery and processes. For these services the employer is asked to pay quarterly a sum of *1s. 6d.* for each puddling, ball, and scrap furnace, *3s.* for each mill, heating, and annealing furnace, and *10s.* for each open-hearth steel furnace or converter.

To facilitate such organization the employer should take an intelligent interest in the working of the Board, make himself acquainted with the rules, give facilities for meetings to the Operatives' Works Representative, and assist him in getting in the contributions by allowing the services of his pay clerks. He should file the minutes of the Standing Committee for future reference, and feel a personal responsibility in the effective working of the Board, and should especially strive to maintain the influence of the Operatives' Works Representative. Complete organization becomes an important *educational* lever. Every work being represented on the Board by an Employers' and an Operatives' Representative, they are in close contact, they use their best endeavour to rectify any wrong, they point out the fallacy of an

imaginary wrong; and these were very common when the workman possessed no tribunal before which a grievance could be brought.

The Operatives' Representatives sift a case of complaint from their side before it is sanctioned for presentation to the Standing Committee. They assist in the preparation of the evidence, select the witnesses, and bring the case before the Standing Committee.

The office of Operatives' Works Representative is one honourable to himself and in the eyes of his fellow-workmen. He is chosen by them because he is discreet though zealous, pacific though courageous, just though sympathetic, and takes a wide and intelligent view of the paths that lead to his fellow-workers' welfare. There is, no doubt, trouble and responsibility attached to the office, but honour and distinction are not to be earned without labour and thought and self-sacrifice. In this country the amount of work done without pay for the public good is enormous, as witness our Magistrates, Councillors, Poor Guardians, and a host of others. They are urged to the work by a sense of duty and the desire to be of service in their generation, and the sweets of public approval and honourable distinction follow. Another of his duties should be to see at the office that the Treasurer has sent a receipt for the operatives' contributions, and this should be posted in some conspicuous place for all the workmen to see. The same may be said of the printed minutes; they should be posted in the works, so that the workmen may read them.

One of the most troublesome duties is the collection of the quarterly contributions, unless the employer assists him by allowing the contributions to be stopped in the office by mutual arrangement with the workman. If such stoppages are made at the request of the workman, and they are of such a nature as to be beneficial to

him, there is no fear of a breach of the Truck Act. As Treasurer of the Board, I have always found that the best-managed works are those which remit their contributions most regularly.

When the Operatives' Section of the Standing Committee has to deal with a very important question affecting the interests of the whole body of workmen, they get the views of that body by calling a meeting of these Operatives' Works Representatives, who are intimate with every man in the works they represent.

Of the Employers' Secretary, as I hold that office, I ought to speak with abated breath. But, if I were a non-official person, speaking with the knowledge gained by my experience, I should repeat what I wrote to M. Lozé, a French gentleman who was making inquiries about the establishment and working of Wages Boards. His question was, "Can you kindly name the difficulties encountered in their establishment and working?" Of the Employers' Secretary I said, "He is usually chosen from among the head-clerks of an employer's office. The atmosphere of the counting-house, where discounts, percentages, costs, and wages' settlements go on day by day, is not often the atmosphere in which a very generous disposition is engendered. Possibly not feeling very assured of his own position, he may feel touchy and sensitive as to the bearing towards him of others, especially the working man. He is liable to take offence at what he may consider familiarity, or if he be of a conceited nature, he may give offence by his treatment of the operative. Again, although he should have a knowledge of the trade and manufacturing processes, it is not desirable that he should be in the service of any of the employers. Being bound hand and foot, with no freedom of action, in that position, the operatives would be suspicious of his views and actions.

They would feel they were not his own, but subject to his employer."

I think you want a well-educated man, that he should have seen something of the world and travelled; a man of large ideas, and somewhat smitten with the spirit of humanitarianism. He should be a master of accounts. The difficulty will be to know how to win the confidence of the Operatives' Secretary, and through him that of the workmen. I can only indicate the way by saying, that he must be absolutely candid and truthful; there must be no dissimulation. He must be in the presence of the employers what he is before the operatives. He must be strong enough to tell an employer that he is doing wrong, if that should be the case. His conduct and manner of life must be beyond suspicion. He must make it a study to win the workman's confidence and respect. Quarrels between the two sides of the Board may easily be hatched between the two secretaries, and unless the greatest cordiality and confidence exists between them, the Board will not work smoothly.

The admirable influence of a wise and discreet president or chairman is reflected upon the whole body which tries to imitate what it admires.

The Employers' Secretary carries with him a responsible position, and it is perhaps a more difficult post to fill because there are not persons in the field who are being trained up to it. The school is the Standing Committee. Employer members are not likely to accept the position if it were offered to them; they have other avocations, and are too closely allied with the employers' interests to escape the suspicion of unfair bias, and yet they are the only people on the employers' side who are receiving the training. It is not an occupation which can be immediately taken up with success without preparation.

The effect of this widespread organization is, that each individual workman knows that he has a tribunal to which he has a right to refer any real grievance, or any proper subject for ventilation or information. The result is, suspicious and imaginary wrongs disappear. He knows that it is useless to raise questions that are ill-founded. He has his mind filled with the thought of the Board and its working, which is ever present to him, and he soon realizes how great a good it is for him to support it. This confidence begets a disposition to be obedient to its rulings.

That such is the result is manifest from numberless cases in which the operatives have asked for the ruling of the Board and have willingly submitted to them. I have known employers leave the Board because a decision was not in their favour, but I have never yet heard of a workman leaving for such a reason.

Whilst boards of the character I am describing are well adapted to large trades, they would be too expensive to be employed in many small trades, and for such the municipal conciliation boards are useful. They, however, lack the educational element. Boards of the type of the coal trade conciliation boards and sliding scale committees, and the working of the Conciliation (Trades Disputes) Act of 1896, are all wanting in the advantages of thorough organization. They do not reach each workman in the trade affected. In fact, there is no membership, no evidence of membership, by paying contributions, however small.

Danger arises when the representatives on a Wages Board are mere delegates and only voice the majority of a mass meeting of workmen who have not heard the evidence or the argument. It is essential that the representatives should be free to exercise their own judgment and the good sense and uprightness for

which they have been chosen—otherwise those qualities are of no service.

The organization of the Midland Iron and Steel Wages Board is as follows:—

President.
Chairman of Standing Committee.
Vice-Chairman of Standing Committee.
Employers' Secretary.
Operatives' Secretary.
Treasurer.
Accountant for the sliding scale.
Auditor.

The Standing Committee has thirteen employer members and thirteen operative members.

The Sub-Committee (which deals with minor matters) has four employer and four operative members.

Every ironworks connected with the Board has an Employers' and an Operatives' Representative, who are elected annually.

The rules of the Board are printed and circulated.

The minutes of proceedings of the Standing Committee are printed and circulated immediately after the meetings.

Wages are settled every two months under a sliding scale. A copy of the accountant's return, together with a statement showing the quantity made of each class of iron, the percentage of the total for each class, the average net selling price of each, and the average net selling price of the whole, is printed and sent to each of the works. The results of the ascertainment are also published in the local newspapers, so that every workman may have full information.

There is in South Wales a Committee formed for the regulation of the sheet mills working under the South Staffordshire Sheet Mill Wages Schedule. It

has some special rules of its own, to provide for local customs; but, apart from those special rules, it is subject to the rules of the Midland Board. In case of disagreement, they have the right to refer any question to the Standing Committee of the Midland Board or its President. The spirit which has prompted the Midland Board to permit the affiliation of this Welsh Board with it, has been that of recognizing a public duty to advance the cause of conciliation as a principle for the settlement of labour disputes.

An important instrument in the working of the Board is the Sheet Mill Wages Schedule. The necessity for having such a schedule arose from the various employers paying different rates for the same class of work. The consequence was a constant endeavour for the higher rates to be reduced and the lower rates to be raised, and thus dissatisfaction on both sides was maintained. The Wages Board appointed a Sheet Mill Wages Committee to form a schedule of rates for sheet-iron rolling and the work associated with it, which should be binding upon all employers and operatives in the South Staffordshire and Shropshire sheet mills. An average of the whole of the rates paid was taken, and wages were based upon it. Only a Wages Board could have accomplished this task; it could never have been done on the old system of each of the works settling their own affairs. It is highly creditable to both sides, for each had to make concessions, which were submitted to without demur.

The sliding scale is in use as *one* of the means of regulating wages. It has always been urged by arbitrators, before whom a question of wages has been submitted, that a sliding scale should be established. The sliding scale in the iron trade was formulated by Mr. G. B. Thorneycroft fifty or sixty years since. He

was at the head of a large firm of ironmasters whose works were situate at Wolverhampton. He suggested to the employers that ironworkers' wages should be gauged by the price of "marked bars," these words indicating a quality of iron which then enjoyed a high reputation. The selling price was uniform amongst the makers of this article, and they fixed it from time to time, and no one under-sold the other. Thus it formed a substantial basis for founding a sliding scale upon. The suggestion was adopted to this extent, that when a demand was made by the men for an advance in wages, any advance that was given was proportionate to the selling price of "marked bars," and so with reductions. The variations were based upon one shilling for each pound of the selling price, but upon exceptional occasions a special temporary advance or promise was conceded. The terms of this arrangement do not appear to have been reduced to writing, though they remained in force for many years, and were well known as "the Thorneycroft scale."

This scale is the foundation of the sliding scales used in the North of England and in the Midlands; in both cases considerably modified and with different bases, but they still retain the shilling in the pound of selling price.

Sir David Dale, speaking of these scales, has said, "To render this a prudent course it must be shown that the wages of the industry to which it is applied have varied in some *steady* relation to the selling price of the commodity produced. Where this is the case a sliding scale has much to recommend it. It furnishes to the workman absolutely reliable information, usually extracted by a public accountant appointed by themselves, from the books of the employers. They secure promptly and automatically an adaptation of wages to varying conditions of trade."

I must not here enter into the merits and demerits of sliding scales, except to add the testimony of one of the best-known Operatives' Secretaries, Mr. Trow, who has said, "We believe it would be most satisfactory if this principle were generally adopted. In all our experience of the past we have had less trouble in the periods in which sliding scales have obtained."

The subject is a large one, but it may be useful to students to be referred to the writings of Professor Munro, read before the Manchester Statistical Society. Mr. Sidney Webb has indeed much to say that is not favourable to the sliding scale as a principle for regulating wages in all classes of labour. We speak of it, however, as it has served us, and can but repeat Mr. Trow's evidence. There is this advantage about a sliding scale, that it may be made elastic to suit the changing conditions of a trade. You may modify it by adding a premium, or increasing or reducing that premium. You may vary the selected firms from whose books the accountant's ascertainments are taken. Or you may widen the area of the commodities which are sold. I do not say that a sliding scale is theoretically perfect; there are several arguments which may be used against them, but in the iron trade it has been found a valuable machine for adjusting wages, both in the interests of the employer and operative.

Once more I would remind you that a sliding scale is no substitute for a Wages Board; it is only an adjunct for dealing with one phase—the settlement of wages. Some people have thought that if there were a sliding scale there was no need for a Wages Board; but it is obvious that this is not so, when we consider the functions of a Wages Board as I have described them. The details of the sliding scale in use by the Midland

Wages Board is a lengthy document, and would occupy too much of your time to investigate clause by clause. I shall have much pleasure in furnishing a copy to any of you who apply to me for one.

As to procedure, it is a principle that each side should be upon an equality in every respect. The operatives contribute as much money in members' contributions as do the employers; and if an additional call for money had to be made, both sides would be equally assessed.

The Employers' and Operatives' Secretaries are paid the same amount of salary. There being twenty-six persons on the Standing Committee, besides the Secretaries, it is needful to have a long table for their meeting. The Chairman is seated *midway* between the two ends of the table, the Vice-Chairman is seated on his right, and next to him, the respective Secretaries sit on the left and right of the Chairman and Vice-Chairman. This gives an opportunity for the Chairman and Vice-Chairman to confer or make suggestions. If they sat at opposite ends of the long table this advantage would be lost. There are moments when a suggestion or alternative course may be made by one to the other which may save the situation. On the right of the Chairman sit the operatives, on the left the employers. The position of honour is intended to be complimentary to the operatives. By this arrangement the Chairman and Vice-Chairman are more accessible to the whole Committee. They are better heard, they themselves hear better, and more readily catch the eyes of the speakers. These may seem to be trivial details, but they are much more important than would at first sight appear, for both sides must be placed in every respect upon an absolutely equal footing. The operative (be it said to his credit) is a very susceptible person, and requires quite as much

consideration and polite treatment as does his employer. He is an excellent judge of character, and very quickly gauges the value of what is said by others, and the *bona fides* of the speaker. Treat him civilly, politely, justly, and considerately, and you will find a responsive friendliness ready on his part. I am astounded to find so many good qualities in working men that the employers have not had the adroitness to turn to account in the past, but I see a vast difference in this respect during the thirty years of my experience.

The Employers' Secretary is responsible for taking the minutes of the meeting and seeing to the printing and circulating of them amongst the employers, the Operatives' Secretary distributing them amongst the Operatives' Representatives.

The notices of meetings are sent to each side by their respective secretaries. The engagement of meeting rooms and the arrangement of seats and tables, with a supply to each member of pens, ink, and paper, is left to the Employers' Secretary.

Meetings before the President are usually held in some public building—the Town Hall or the Assize Courts—to which the public press are invited. A Board of this kind, affecting the interests of some twenty-five thousand workmen, and conducted in this thorough manner, is necessarily costly, and my account would be incomplete if I did not refer to the finances of the Board. The sources of revenue are contributions paid quarterly by the employers and operatives in South Staffordshire, Shropshire, and South Wales, and one or two works in the outlying districts; but North Staffordshire and Lancashire send only donations from employers—the operatives there contribute nothing. This is not a fair arrangement, as they have all the benefits of the Board. Our total expenditure ranges from £800

to £900 a year, the outgoings being the salaries and expenses of the Secretaries, allowances to employers and operatives for attendances and railway fares, meeting rooms, accountant's fee for the examination of the employers' books for the sliding scale, printing and stationery. The money is small in amount as compared with the losses from strikes and labour troubles.

The rules of the Board are important, and are based upon those of the North of England Board. It is scarcely necessary to read them here. To those who are making a serious study of our subject, I shall have much pleasure in sending a copy if they will give me their names and addresses.

The question arises, How are we to enforce the decisions of the Board or its President? Sir Rupert Kettle, a County Court judge, well known as an arbitrator in labour disputes, did not think the mere fact of an employer or operative contributing to a Wages Board was sufficient in law to bind him to any and every act of the Board; that there was not sufficient mutuality between the contracting parties, and that such evidence would not stand in a court of law.

It was therefore attempted to identify the membership of each man by having his name entered upon the contribution-sheets which were sent in and signed by the Operatives' Works Representatives. That, however, does not appear sufficient to bind each workman, as nothing less than the workman's own signature to the agreement of employment can bind him in law for such a purpose as enforcing upon him the decisions of the Board.

But we are getting into times when the School Board has widened the minds of workmen, and it is more or less possible to show them that there is a mutuality of interests in these trade operations for

themselves and for their employers. Wherein lies this "mutuality of interests"? In the first place, the employer could not conduct his business without the operative, nor could the operative have the opportunity of earning his wages without the employer. The employer finds capital, his technical and commercial knowledge and training, his time and mental exertion in directing. The operative, in addition to earning a fair and reasonable wage, is interested in the regularity of the operations, that there should be plenty of orders, and that the business should be continued. For that reason it is his interest to avoid waste, whether by himself or others, to work industriously, and to claim from his co-operators that they should do their part. Both sides have to run the risk of bad trade and scarcity of orders, and each bears its share; but well-directed works, with intelligent co-operation of the workmen, will survive bad times, when mismanaged works, with discontented and reckless workmen, will go to the wall. Is there no mutuality in the maintenance of peace and good understanding? The two interests are so interlocked that one cannot suffer without the other. And yet we were told by the leaders of the Socialists in London, at a meeting of the Industrial Union, that there was no such thing as "mutuality of interests" between employer and operative.

The operatives are observant of the decisions of the Board, because they can see that much higher wages cannot be paid to them than they are paid in a competing district. They read their newspapers and know what are the districts competing with them; and if the whole body of men do not understand this, their leaders do. What stronger motive can we have amongst a body of workmen than a desire to keep themselves employed with a fair share of such trade as there is? The leaders

of the men learn the folly of pursuing a policy which would deprive the district of employment. Then the leaders of the operatives on the Wages Board are also the head men of the operatives' association, and they will not find money to support a policy which they condemn. If there is one thing more fully established of late years than another, it is the gregarious character of working men, and they, at no period of their history, have shown so great a tendency to follow their leaders.

The breaking away from a decision of the Board is not necessarily an act of the operatives. We have had several cases of employers leaving the Board because the decision has not been in their favour.

The Board may be broken up in a constitutional way by notice being given under its rules. It is, therefore, one of the necessary features of a Wages Board that each side should have behind it a strong association formed amongst themselves, so that if any unreasonable attack be made by one side or the other, they shall be ready for defence or attack. That was the attitude in old days, and it was the want of a "buffer state," or Wages Board, in between the two associations, which occasionally led to a trial of strength. This may be thought a very cumbersome kind of machinery, but it must not be forgotten that those associations have many functions to perform which have nothing to do with the Wages Board. Thus the employers' association deals with parliamentary questions, railway and canal rates, and a variety of subjects which do not come before the Wages Board. The operatives' association deals with such questions as aliment to those out of employment in certain cases, burials, etc., and performs some of the duties of friendly societies.

The whole operation depends upon the suppression of self and the exercise of common sense. You cannot

make men wise or moral by Acts of Parliament, and punishment does not prevent the criminal from re-enacting his offence. If you can show a man where his interest and welfare lie, and what road will lead him to it, you have the greatest hold on him. The mass will follow their leaders, and if you have honest leaders you are safe. The Standing Committee is virtually a court of inquiry, and its decision is as good as that of a law court, so long as the Board is loyally maintained on both sides and upon the principles I have indicated.

If you cannot bring such principles to bear upon the conduct of men, you must revert to the old position of unreasonableness and trial of strength, and go back in the progress of social reform for two generations. But I don't believe that will ever happen with a Wages Board constituted on our lines. There is among British workmen good soil to be ploughed and worthy of steady and industrious cultivation. The plough is the Wages Board, the fruit is peace and plenty.

The literature of the Board, under its long term of existence, has naturally grown to large proportions. It consists of voluminous minute books, a book of rules and instructions, the terms and conditions of the sliding scale, the printed annual reports and statements of accounts, newspaper reports of the proceedings before the President and at the annual meetings, printed minutes of the proceedings of the Standing Committee, together with the Accountant's returns. These are invaluable for reference. There is also a printed Schedule of Sheet Mill-men's Wages. The accumulation of letters and papers has grown to huge proportions, and may some day be useful to authors on economic questions.

All of this goes to say that an institution which has been built up with so much labour, care, and expense,

and has been so successful in avoiding anything like a strike (for we have never had one since the foundation of the Board), is not to be lightly treated or cast on one side.

To show how effectual have been the proceedings of our Board, based upon the principles I have indicated, I may mention that we seldom have to appeal to the President. Over a period of nine years we have only referred one case to him.

To show, further, the spirit which actuates the Standing Committee, I remember a question of the amount of the premium under the sliding scale being under discussion for more than twelve months. It seemed impossible to come to any decision, and the employers proposed to refer the matter to the President. The Operatives' Secretary said he thought it a poor compliment to themselves, a body of twenty-four right-intentioned men, to refer a question to the President which they ought to settle themselves. He proposed an adjournment, and at the next meeting a settlement was arrived at.

With all that I have said in favour of Wages Boards, there are yet before them elements of danger. It would seem to be scarcely possible that employers who had been members of the Board for some time should retire because a decision was against them ; but I have known more than one case of this kind. Some firms have retired because they have thought, and perhaps have found, that they can make more favourable terms with their operatives ; that is a circumstance closely watched by the Ironworkers' Association, who are strict in maintaining customary and scheduled rates of wages. Where the head rollers in sheet mills, jealous of an aspiring young workman, refuse to give him the opportunity of becoming a head roller, we find the latter bids

for employment by accepting a lower wage than the standard. Such terms can only be accepted by firms who are not members of the Board, which requires its schedule of wages to be observed. For this reason some firms have withdrawn from the Board.

Then a new generation of young workmen springs up which has not known the horrors of a strike. They have not earned the wisdom of their forefathers by experience. Young blood courses through their veins; they are slow to reflect but hasty to perform. This points to the need of promoting the educational features associated with thorough organization, and frequent consultations, whereat the older and more experienced may hold up before the headstrong the wiser path of moderation.

Let me now recapitulate the advantages of a Wages Board, if it can be carried out upon the lines *we* follow.

1. Where there is no Wages Board, and no degree of uniformity in wages paid for similar work, there is always a spirit of dissatisfaction on both sides; comparisons of pay-rates are made, and the discrepancies are known. It may be quite true the varying conditions justify the difference in the rate, but if you have no Standing Committee to investigate the case, the spirit of complaint and dissatisfaction remains.

2. On the introduction of improved machinery or altered conditions of work, you want a third party to assess the value of work under those circumstances.

3. Where there is no tribunal before which a grievance can be brought, that can give a fair hearing to any case that may arise, there is not only a tendency for the operatives to be possessed with imaginary wrongs, but a temptation to unreasonable employers and managers to take advantage of those who are defenceless and have no protection. Such a condition

cannot exist under our system of free and complete investigation before the Standing Committee. Injustice is not attempted, because it is known that it will be investigated.

4. The tendency of a Wages Board is certainly towards a greater uniformity in wages, and it prevents attempts in isolated instances to reduce wages in order to undersell a competitor. It is well known that in a falling market, when orders are scarce, concessions from the workmen are sought for, and being obtained, are immediately given to the buyer. This may momentarily secure an order; but its effect is generally to depress the market still more, and so damage the interests of both employer and operative. It is better to let the wages of the whole body of workmen *follow* the market, as is the case with a sliding scale.

5. We assume that each of the works are represented by the employer and an operative: and each of the works being (theoretically) represented by an employer and an operative, and all operatives being members of the Board, there is a tendency towards loyalty to it; they look upon it as their protection, they are willing to maintain it financially, and to be obedient to its rules and submissive to its decisions. They realize that it is working as much in the interests of one side as of the other. The Operatives' Representatives are brought in contact with the employers at frequent meetings. By courteous and considerate bearing towards each other, by witnessing the desire on both sides to do what is right and fair and just, there gradually springs up a mutual confidence and respect, a belief that each means what he says, and is prepared to support his statements if needful. The impression that each side is attempting to hoodwink the other gradually dies away, and mutual confidence is the result. Of course in making the

selection of representatives it is all-important that persons of the best principles, as well as of great practical knowledge, should be chosen.

6. There is no limit to the subjects that may be dealt with by a Wages Board so long as they have some relation to the interests of both parties.

7. The employer is benefited by keeping his works going and maintaining the output, reducing common charges, and saving waste, for it is a fundamental rule that there shall be no cessation of work owing to a dispute; the decision, if delayed, can be made retrospective. The employer escapes trouble and anxiety by having a committee to whom any question can be referred, by having the rate of wages settled regularly over bimonthly periods, and he maintains good relations with his workmen. The operatives benefit in the same way; they acquire access to the employers' books, and under the discipline of the Board become more orderly.

Our Board in the early stages might be compared with a "buffer state" between antagonistic parties. To-day it is a "link of mutual interests."

I look upon conciliation and arbitration, Wages Boards, Joint Committees, Sliding Scales, or whatever may be described as an instrument for maintaining reasonable and proper relations between employers and employed, as a phase in social evolution, probably something beyond our reasoning, something which was bound to come as a natural law. They are a necessary consequence of other movements in the world—a work which young men who are our successors are called upon to study and promote.

Other nations are inquiring into our methods, and I have had both French and German commissioners seeking for information by letter and personal interviews. We have before us to-day two examples of

labour troubles—one in Pennsylvania, another in France. You will notice that these strikes are not allowed to work their ruin as in old days. The State steps in when the nation begins to suffer, and the final stage is arbitration. Yes, they are wise after the event: "Prevention is better than cure."

THE BRITISH COTTON INDUSTRY

Elijah Helm

I

MOST readers of English newspapers have, I imagine, been much perplexed—many perhaps alarmed—by the persistent stream of depreciation which has for some years been poured upon our industrial and commercial methods and their results. We are told that our pre-eminence is gone, that we are falling back in the race, and sometimes that we are upon the slope of permanent decadence. There are several methods of testing the value of such statements as these. One of the best is to examine the facts in respect of each branch of industry and trade thoroughly, with care and with an open mind. This I propose to do in the case of the British cotton manufacture in the two lectures which the Dean of the Faculty of Commerce of this University has invited me to deliver. In the first of them I hope to put before you a brief historical sketch of the industry, to describe its present organization, and to consider its recent progress and its existing position. In the second lecture a survey will be taken of the cotton industries of other countries, and the results of the whole investigation will be summarized and compared.

In one respect the British cotton manufacture differs

essentially from the great group of industries with which this capital of the Midlands is closely associated. Its raw material is derived entirely from abroad, and the greater part of its productions is consumed abroad. The cotton used in our mills is grown in other lands, most of it thousands of miles away, and fully three-fourths is distributed, in the manufactured state, to every part of the globe. Yet from the very beginning of the industry as a mechanical art the pre-eminence has always remained, and still remains, in Great Britain. This remarkable feature will have to be kept clearly in mind in forming any final conclusions as to the present international position.

We need not spend very much time upon the historical aspect of our subject; yet there are some striking points in it which must not be left unnoticed. Regarded as a completely mechanical industry, the cotton manufacture is not quite a hundred years old. It is true that in the latter half of the eighteenth century the inventions of Hargreaves, Arkwright, Crompton, and others had substituted spinning-machines, which would now be regarded as ludicrously simple and inefficient, for the old hand spinning-wheel. At the same time, machines were introduced for cleaning, carding, and otherwise preparing the fibre for the spinning process. All these were first used in England; and for a time the yarn they produced was much valued abroad, as well as at home, because of its superior quality. But other nations, particularly the United States, were not long in adopting the improvements. Weaving was still all over the world a handicraft process. Early in the nineteenth century an effective power loom was invented; but it was not until 1860 that the old hand-loom was entirely driven out from the British cotton industry. Even now it is still extensively

employed in every civilized country except the United Kingdom and the United States. In America it lingered for many years after it had completely disappeared here. The tardiness of its extinction abroad is a fact which should be emphasized now, because it will have an important bearing upon the question of the international position to which I shall invite your attention at a later stage.

The full application of machinery to the spinning and weaving of cotton in Great Britain began in the midst of very unfavourable circumstances. The country was engaged in the prolonged and highly destructive Napoleonic wars. Taxation was grievously oppressive; the currency was disordered by depreciated paper money; bread was artificially dear; inland transport was impeded by bad roads, and sea transport by warlike perils. Wages were low, employment precarious, and even the middle classes were more or less impoverished. Added to these depressing circumstances there was another, the influence of which was not fully comprehended at the time. Inventive genius was beginning to substitute, more rapidly than before, machine production for handicraft, especially in the textile industries. Power looms were being introduced, and the wages of hand-loom weavers, by whom weaving was still mainly carried on, fell to a pitifully low level between 1815 and 1820. In the cotton industry the state of affairs was so dark and discouraging that the Board of Directors of the Manchester Chamber of Commerce undertook a special investigation into its distressed condition during the winter of 1820-1, in the course of which some of the numerous defects in the laws affecting commerce and industry were laid bare.

In 1820 the cotton manufacture of Lancashire was rapidly advancing towards the position it ultimately

took, as the most important of British industries, except agriculture. But it was hampered by fiscal burdens, the mere mention of which is enough to give a shock to the spinner and manufacturer of our day. First, there was the import duty on raw cotton, originally imposed in 1798, and not repealed until March 19th, 1845. The amount of it varied from time to time, but the normal rate was 1*d.* per lb., the ratio varying between 10 and 15 per cent. From 1809 to 1814 the duty was 2*d.* per lb., or about 20 per cent. In 1821 West India cotton was especially exempted from duty, other kinds paying the original rate until 1828, when the duties were 6 per cent. on all foreign-grown cotton, and 4*d.* per cwt. on that produced in British possessions. In 1831 the duty on foreign was fixed at $\frac{5}{8}$*d.* per lb., that on British remaining as before; but the former was reduced in 1834 to three-tenths of a penny, with an addition of 5 per cent. all round, imposed in the year 1840. These rates were charged only when cotton was brought in British ships. During a considerable part of this period the Navigation Acts were in force, and, in harmony with their principle, the duties on cotton when imported in foreign vessels, from whatever source, were much higher than the rates just quoted. At one time these amounted to 3*d.* per lb., or from 30 to 50 per cent. of the market prices.

Another onerous and still more vexatious impost was the excise duty on printed calicoes. This was originally levied in 1712, as part of a general tax on printed textiles, including silks and linens, but excluding all goods of which wool was the sole or chief raw material. This exemption was made in pursuance of a traditional policy designed to encourage the growth and manufacture of wool in this country. Again and again the Manchester Chamber made representations

to Government and to Parliament, setting forth the seriously repressive effect of the excise duty on prints, not only because of its amount, but also because it involved the innumerable inconveniences and annoyances incident to the presence and scrutiny of supervisors at the print works. Other vexations were connected with the settlement of the drawback on British prints exported. It was not until 1831 that this obnoxious tax was removed. It was surrendered only after a severe and prolonged struggle. The gross produce of the tax was £2,000,000, but owing to the heavy cost of its administration and collection, and the amount of drawback on exports, the net produce was not more than £500,000. When the abolition of the duty was decided upon, the Chancellor of the Exchequer, Lord Althorp, proposed, by way of compensation, to double the import duty on raw cotton, then reduced to about a halfpenny per lb. Thereupon the Chamber sent a deputation to the Treasury to protest against this substitution. The result of the interview, which took place on February 5th, 1831, was that the Chancellor of the Exchequer, with whom was the Prime Minister, Earl Grey, consented to only a slight increase in the duty on raw cotton, making it $\frac{5}{8}d.$ per lb.; and when the Budget was shortly afterwards introduced, it was found that the print tax, after an existence of more than a century, was at last omitted. The import duty on raw cotton was retained, however, until March 19th, 1845.

But many other taxes upon commodities used in the cotton and other industries were imposed during the quarter of a century after 1820, some of them even later. Amongst these materials were flour and starch, leather, soap, dyestuffs, paper, timber, bricks, and tiles. The concentrated effect of the taxes upon the cost of manufacturing production generally may be imagined,

although it cannot be precisely reckoned. It is quite certain, however, that this was very serious, and from time to time the Manchester Chamber took steps to mitigate the burden.

It was recognized, however, that the heavy national obligations resulting from years of costly war had to be borne; and it was not until the Anti-Corn Law agitation had been set on foot that statesmen began to discern the wastefulness of a system of indirect taxation which brought almost every article of consumption within the fiscal net either for import or excise duties. There is not very great exaggeration in the following graphic satire of Sidney Smith, published in the *Edinburgh Review* of 1820:—

"Taxes upon every article which enters into the mouth, or covers the back, or is placed under the foot. Taxes upon everything which it is pleasant to see, hear, feel, smell, or taste. Taxes upon warmth, light, and locomotion. Taxes on everything on earth or under the earth, on everything that comes from abroad or is grown at home. Taxes on the raw material, taxes on every fresh value that is added to it by the industry of man. Taxes on the sauce which pampers man's appetite, and the drug which restores him to health; on the ermine which decorates the judge, and the rope which hangs the criminal; on the poor man's salt and the rich man's spice; on the brass nails of the coffin, and the ribbons of the bride; at bed or board, couchant or levant, we must pay. The schoolboy whips his taxed top; the beardless youth manages his taxed horse, with a taxed bridle, on a taxed road; and the dying Englishman, pouring his medicine, which has paid 7 per cent., into a spoon that has paid 15 per cent., flings himself back upon his chintz bed, which has paid 22 per cent., and expires in the arms of an apothecary, who has paid

a licence of a hundred pounds for the privilege of putting him to death. His whole property is then immediately taxed from 2 to 10 per cent. Besides the probate, large fees are demanded for burying him in the chancel. His virtues are handed down to posterity on taxed marble, and he will then be gathered to his fathers, to be taxed no more."

But heavy taxation upon the chief raw materials and accessories of the cotton industry in the first half of last century was not the only incumbrance which it had to bear in the years when it was rising to the lofty position it ultimately attained. The expense of bringing raw cotton from the sources of supply to Lancashire was very much greater sixty years ago than it is now. The cost of freight alone from the United States was about 1*d.* per lb. It is in our day from $\frac{1}{16}d.$ to $\frac{3}{32}d.$ per lb. But an important reduction has also taken place in other charges besides freight. The saving in interest, in the profits of the merchant, and other minor items, is very considerable.

If, then, it was possible to raise the Lancashire industry to a position of unapproached magnitude and efficiency, in spite of the fact that its principal raw material had to be brought from fields thousands of miles away, and notwithstanding extraordinarily heavy taxation, there must have been forces and circumstances of the highest importance favouring its growth and concentration in the County Palatine. Foremost among them were the moist condition of the local atmosphere, which was highly suitable for the spinning and weaving of the cotton fibre; the energetic, self-reliant, and inventive character of its people; the abundant supply of fuel; and the excellence of its industrial and commercial organization.

The British cotton trade of our day presents an

example of the highest type of commercial and industrial methods. Separation of functions, and the co-operation of each with the others so as to produce the greatest economy and efficiency, are, and have long been, carried out more fully perhaps in Lancashire than in any other part of the world. The great extent and the varied nature of the trade, as well as its early development there, have done much to bring about this highly systematized condition.

Much the largest part of the cotton consumed in this country is American and Egyptian. Of the former the proportion is about 80·5 per cent., of the latter 15·7 per cent. These two descriptions constitute, therefore, 96·2 per cent. of the whole, the small remainder, rather less than 4 per cent., being Brazilian and other growths. Of East Indian cotton the quantity used in English mills is now a mere trifle.

The most thoroughly organized branch of the raw cotton trade is that of American. It is, consequently, the most economically managed. The British supply is bought by merchants, acting sometimes on their own account, and sometimes on the orders of spinners or other merchants, either at the American shipping ports —Galveston, New Orleans, Mobile, Savannah, Charleston, New York, and other Atlantic ports—or at the interior towns where some English merchants have establishments. Most of it comes to Liverpool or Manchester, where the markets are conducted under well-defined and efficient regulations.

An important modern feature of the raw cotton trade, which has received its fullest development in the department of American, is the market for "futures." The business to which this name is given comprises contracts for delivery at specified periods, the seller usually having the right to deliver at any time during

the particular month specified in the contract. In practice, however, only a minute proportion of the "futures" transactions end in actual delivery. They are concluded by the payment of "differences" at stated intervals. This branch of the cotton market is of great utility as a mode of securing persons engaged in the cotton trade, from the planter to the spinner, against the risk of violent or unexpected fluctuations of prices, in a manner which I will presently explain. It is also an inviting field for the pure speculator, and a good deal of money is, in fact, made and lost in it. The business is carried on upon an enormous scale in Liverpool and New York, to a less extent in the ports of the Southern States, and it exists to a moderate extent at Havre and some other continental ports.

There are four classes of dealers in the Liverpool futures market:—

1. Merchants, who use it for the purpose of "hedging."
2. Spinners and manufacturers, for "covering" or "hedging."
3. Planters in America, for "hedging."
4. Pure speculators, who employ it for buying, selling, and "straddling."

To the merchant-importer the futures market is highly serviceable. He may buy cotton with its aid, say, in America, for importation, to an extent far beyond the amount to which he would, in prudence, be restricted without it. Immediately after being advised by telegraph of the purchase of a quantity of cotton in America by his partner or correspondent on the other side of the Atlantic, he enters into a contract in the "futures" market for the delivery of an equivalent quantity, say one or two months later. He is thus insured against a fall of prices, and can go on without anxiety to purchase

more in America. When the cotton arrives and is sold here, he forthwith buys futures, and uses the paper vouchers to cancel his previous sale of them, so closing his insurance transaction. He thus provides against any important adverse change of prices during the interval between the purchase in America and the sale in this country.

The English spinner or manufacturer who has accepted orders for his yarn or cloth for the home or foreign or colonial markets, finds also a mode of insurance in the cotton futures market. He at once buys as much as may be needed to "cover" his sales. If he has sold at a profit, this is secured against fluctuations of price in the interval between the date of sale and the agreed date of delivery. Usually the spinner does not in such a case take actual delivery under his futures contract, because the seller, having a wide liberty as to the particular quality which he is at liberty to deliver—always with due allowance for variation from the recognized standard basis—may not tender the exact grade desired by the spinner for actual spinning. The latter, therefore, selects cotton by sample for actual use, immediately disposing of the futures, which have served his purpose as an insurance against a rise of prices.

On the other hand, the American planter, or the financial agent who has made cash advances on his yet unreaped crop, is enabled to avoid loss from a fall of prices by selling futures beforehand equivalent to the amount of the growing cotton which has to be gathered later on. This process, as well as that employed by merchant-importers, is called "hedging."

The futures market is very fully organized. It is obvious, however, that its perfection in this respect, and the constant variation in the requirements of buyers

and sellers for insurance purposes, invite the attention of pure speculators. They employ their minds continuously in studying the wants of buyers and sellers, the constant varying prospects of supply and demand, and in trying to snatch a profit from the daily or momentary variations of prices. This is their vocation. Unfortunately, they employ their knowledge and opportunities, not always by strictly legitimate means, to control the markets for their own calculated advantage, and often to the serious disturbance of regular trade. The cure for this evil is not to be sought by legislative means. Experience has shown that great speculators have almost always—I do not know of a single excepton—become poor men. Their ruin is, of course, no solid consolation for those who have suffered from their adventures. And yet, in spite of the troubles to which regular trade is exposed by pure speculation in the cotton futures market, and of the undoubted fact that some eminent merchant-importers have been driven out of the trade by their operations and manipulations, it cannot be doubted that the futures market in the raw cotton trade rests upon the secure foundation of utility, in so far as it supplies a convenient and widely employed mode of insurance against the risks of fluctuating prices.

English spinners, especially in South Lancashire and in the adjoining border-land of Cheshire, Derbyshire, and Yorkshire, are every year receiving more and more of the cotton they use from the United States and Egypt, by direct shipment to the port of Manchester. The cotton thus imported is either bought by the spinner in America or Egypt, or afloat, from merchants who have shipped it in anticipation of the wants of their spinning customers. There is no "futures" market in Manchester, and only a small quantity is sold there on the spot.

Abundant storage capacity exists at the dock-warehouses; but most of the cotton is discharged directly from the hold on railway waggons or barges, and at once sent to the mills by rail or canal. Thus spinners find a very substantial saving by using the ship canal.

The rapid growth of this traffic, since the opening of the canal, in each cotton season, from September 1st to August 31st, is shown in the following figures:—

IMPORTS OF COTTON TO THE PORT OF MANCHESTER (AMERICAN AND EGYPTIAN).

	American bales.	Egyptian bales.	Total bales.
1894 (from Jan. 1st)	20,643	2,234	22,877
1894–1895	31,755	32,708	64,463
1895–1896	121,336	68,123	189,459
1896–1897	211,623	88,021	299,654
1897–1898	245,853	98,563	344,416
1898–1899	311,003	84,627	395,630
1899–1900	415,000	136,750	551,750
1900–1901	442,695	107,178	549,873
1901–1902	420,865	125,617	546,482

The mechanism of the Manchester cotton goods market now claims our attention. The cotton industry of the United Kingdom is much more highly differentiated than that of any other country. Not only is the variety of the productions much greater, but also the several branches of the industry are specialized to a degree not known elsewhere. In the first place, the two operations of spinning and weaving are, in the main, separated, being conducted to a great extent in different districts. Thus spinning is largely concentrated in South Lancashire, and in the adjoining border-land of North Cheshire. But even within this area there is further allocation. The finer and the very finest yarns are spun in the neighbourhood of Bolton, and in or near Manchester, much of this being used for the

manufacture of sewing thread; whilst other descriptions, employed almost entirely for weaving, are produced in Oldham and other towns. The weaving branches of the industry are chiefly conducted in the northern half of Lancashire—most of it in such large boroughs as Blackburn, Burnley, and Preston.

Here, again, there is differentiation. Preston and Chorley produce the finer and lighter fabrics; Blackburn, Darwen, and Accrington, shirtings, dhooties, and other goods extensively shipped to India; whilst Nelson and Colne make cloths woven from dyed yarn, and Bolton is distinguished for fine quiltings and fancy cotton dress goods. These demarcations are not absolutely observed, but they are sufficiently clear to give to each town in the area covered by the cotton industry a distinctive place in its general organization.

There are obvious advantages in all this differentiation. One of them is that it facilitates excellence of quality and abundant production; the workpeople and the whole of the staffs employed at the mills—from the managers downwards—becoming trained and highly skilled in the manufacture of the particular classes of goods to which their attention is exclusively and continuously directed. Indeed, this mode of organization is absolutely essential to the success of the British cotton industry, because of the great diversity of taste, of climate, and of buying power of the numerous races and peoples in the world-wide markets to which British cotton manufactures are sent.

In the processes following that of weaving to which the fabric is submitted, except when it is exported in the "grey" state, there is also much further separation of processes. These are, chiefly, calico printing, bleaching, dyeing, mercerising, and finishing; that is to say, the further final process required in many cases to give

the completed fabric the exactly appropriate appearance and touch needed to tempt and satisfy the taste of the buyer.

But the most remarkable separation of functions in the cotton goods trade is the almost complete distinction between the businesses of manufacturing and distributing. Until about the year 1820 the Manchester cotton manufacturers whose productions were sent abroad, conducted their trade directly, having their agents at the principal centres in such countries as were open to receive British cotton goods. Some states—France and Austria, for example—prohibited their importation. In other countries Manchester cottons were, to a large extent, sold at periodical fairs, as at Frankfort, and at other centres in Italy. During the Napoleonic wars this trade was attended with great risk—warlike and financial—and delay. Goods were sent, of course, by sailing vessels, and for a long time these could leave English ports only under the convoy of ships of war.

Such perils disappeared, however, after the re-establishment of peace in 1815; and from 1820 the characteristic trade of Manchester began to expand rapidly, and to undergo a remarkable change in its method. With the introduction and improvement of machinery, both for weaving and spinning, the business of distributing cotton goods gradually became separated from that of producing them. A distinct class of merchants arose—some devoted entirely to foreign, others to home trade. At first the over-sea trade was conducted by English, Scotch, or Irish houses; but these were soon joined by Germans, chiefly from Hamburg or Frankfort, some of whom had previously acted as agents for Manchester manufacturers.

Before 1825 the export of merchandise from England to the Turkish Dominions had been exclusively in the

hands of the Levant or Turkey Company, under a Charter granted originally by Queen Elizabeth in 1581. Its trade might be conducted only from the port of London. Adam Smith, in his "Wealth of Nations," describes this Company as "a strict and oppressive monopoly." Its position was certainly a very extraordinary one, for it bore the cost of supporting a British Ambassador at Constantinople and Consuls at Aleppo, Smyrna, and other places. The trading monopoly of the Company extended over the whole of the Sultan's possessions in Europe, Asia, and Africa. After the surrender of its Charter in 1825, Greeks came to Manchester to open up the trade with Turkey. By their energy and commercial skill, as well as their knowledge of the East Mediterranean markets, they gave very considerable aid to the distribution of Manchester cotton goods. Later on, assisted by the wealth they had acquired, some of them launched out into the cotton goods trade with India and other large markets, and their descendants are now in the foremost rank of British merchants. Other foreigners have, in like manner, settled in Manchester, and have contributed greatly during the last half-century toward the extension of its trade to all parts of the world. Mainly, however, this has been the work of English, Scotch, and Irish merchants, who, by devoting themselves exclusively to the work of distribution, have become an important and now indispensable auxiliary to the cotton industry of Lancashire.

II

Hitherto I have endeavoured to fix your attention upon the circumstances—many of them very unfavourable—in which the cotton machine-manufacture of this country was founded, tracing its progress, and pointing out the pre-eminent position which it finally attained, and which it still holds. It was the first, by many years, to abandon entirely the hand-loom for weaving; and in no other great cotton-manufacturing country, except the United States, has the use of that primitive instrument ceased even now. I then described the mechanism, first, of the cotton markets through which the raw material of industry is brought to the mills, and secondly, the mechanism of the distribution of the manufactured product from the primary market in Manchester to the areas of consumption throughout the world.

I now proceed to set before you the salient points in the progress of the industry in other lands where the industry has extended most rapidly during the last thirty years, viz. the United States, the European Continent, and Asia.

Cotton spinning and weaving by machinery began in America almost as early as in Great Britain. From priority of establishment, therefore, the English industry gained little. Indeed, during the Napoleonic wars, at the end of the eighteenth and in the earlier part of the nineteenth century, the advantage was with the Americans, since they were then, and for a long time

afterwards, free from the heavy duties on raw cotton and other materials of production which oppressed the spinners and manufacturers of the United Kingdom. Moreover, the brief war of 1812–15 between the States and the old country gave a strong impetus to the American industry. The prices of cotton goods across the Atlantic rose to four times their previous amount; and cotton-spinning mills there were multiplied so greatly that, after the restoration of peace in 1815, many of them were closed, and became for a time almost worthless. In the following year protective duties were imposed, mainly by the influence of the Northern representatives in Congress, for the purpose of reviving and encouraging home manufactures, the cotton planters of the South being mostly opposed to them. Previously steam and water power had been applied only in the spinning branch, but in 1813 the first mechanical looms were erected. Only a few were then in existence on this side the ocean. In 1816 there were but 2000 power looms in Lancashire. In Switzerland, France, Germany, and even in Austria, Italy, and Belgium, the factory system of spinning was developed almost as early as in Great Britain; but weaving by power looms was only partially established on an important scale by 1830, except in a few particular districts such as Alsace, the Vosges, Rouen, Elberfeld, and two or three Swiss cantons.

Bearing in mind the fact stated in my last lecture that, regarded as a completely mechanical industry, cotton spinning and manufacturing had not become thoroughly established in this country until toward the close of the first thirty years of the nineteenth century, you will have no difficulty in coming to the conclusion that at that period it had not gained an appreciable priority in time over its American rival. Its position in

1831–35, in relation to the cotton industries of the Continent and the United States, is approximately indicated by a few figures. In those five years the average annual consumption of cotton was—

	Millions of lbs.	Per cent.
United Kingdom	295·2	100
Continent of Europe	142·7	48·3
United States	78·5	26·6

So important had been the progress of the industry in Europe and America between 1820 and 1835 as to prompt the following significant remarks in the Introduction to Dr. Ure's "Cotton Manufacture of Great Britain":—

"The encroachment of foreign competition upon the cotton trade of the United Kingdom has become so rapid of late as to excite alarm for its supremacy, under our heavy taxation, in any mind not besotted by national pride. The Continent of Europe, and the United States of America, for some time after the peace of 1815, possessed factories upon so small a scale that they could not be regarded as our rivals in the business of the world. But now they work up nearly 750,000 bales of cotton wool, which is about three-fourths of our consumption, and have become formidable competitors to us in many markets once exclusively our own."

This was written in 1838. Another instance of alarm at the supposed relative decline of the English cotton industry in that year, when the Board of Trade forwarded to the Manchester Chamber of Commerce a number of samples of various descriptions of cotton piece-goods, including prints, produced in Germany and Switzerland. These were examined by a committee, of which Mr. Cobden was a leading member. The report shows that he and his colleagues were

deeply impressed by the excellence and cheapness of these productions; and there is conclusive evidence, in a memorial to Parliament which he drafted two years later upon British customs and excise policy at that time, that he had begun almost to despair of the English cotton industry as a competitor with the corresponding industries of the Continent, unless the oppressive fiscal burdens then laid upon it were removed. But even since the advent of Free Trade fears of approaching decline have, on several occasions, been expressed more or less loudly. The question we have to consider is, therefore, not new, although it is raised under new conditions. What is the relative position of the industry in the United Kingdom, the Continent, and the United States to-day, measured by the quantity of raw cotton consumed in each? In the last cotton season—the year ended on September 30th, 1902—the consumption in these three great divisions was—

	Millions of lbs.	Per cent.
United Kingdom	1626·5	100
Continent of Europe	2392·0	147
United States	2018·5	124

Judged, therefore, by the test of the amount of raw material consumed, Great Britain has fallen from the highest to the lowest position within the last seventy years:

We have, unfortunately, no trustworthy statistics of the number of spindles at work in each of these divisions during the period 1831–35. The number now employed, however, it is possible to state; and the result of a comparison presents a striking contrast with that we have just arrived at from the statistics of cotton consumption. Here they are—

	Cotton-spinning spindles.	Per cent.
United Kingdom ...	... 47,000,000 ...	... 100
Continent of Europe ...	... 33,900,000 ...	... 72·1
United States	... 21,559,000 ...	... 45·8

From this point of view Great Britain again takes the first place, the Continent following second, and the United States third as before, though much more closely in both cases.

The apparent paradox that, whilst still possessing very much more spinning machinery than the Continent or the United States, we spin very much less weight of cotton than either of them, is easily explained. The yarn produced in English mills is by many degrees finer and of higher value per pound than that spun in the mills of the other two regions. For many years English cotton yarn has been growing finer and finer. This change has been brought about by two or three causes, but mainly as a consequence of the increase of machinery in countries to which our coarser yarns and piece-goods were formerly sent. These they now produce much more extensively for their own consumption, still leaving to us the production of the finer descriptions. Another explanation is that the progress of mankind in wealth and refinement has increased the demand for superior, more varied, and more tasteful cotton fabrics, requiring for their production finer yarns. For the spinning of these, and in a great degree for the weaving and finishing of the superior fabrics, our climate and the training and skill of our managers and work-people, as well as the industrial and commercial organization of the English cotton trade, have proved themselves admirably adapted.

But we have still to answer the question, Why has the increase in the consumption of cotton been so much greater in the Continental countries and in the United States since 1835?

Largely, no doubt, this change is due to the improved economic condition of the people in those parts of the world and to the enormous growth of their populations. To these influences must be added the sense of political security which followed the Franco-German War. Industry and commerce were relieved from many depressing uncertainties, and the energies and enterprise of the people in Continental states, aided by their excellent and previously existing system of national education, were set free to engage much more fully than before in the creation of wealth, and in its exchange at home and with foreign countries. The previous removal of Customs restrictions upon the internal trade of Germany, and the liberal tendency toward unrestricted trade throughout Europe, set in motion by Mr. Cobden's Anglo-French Commercial Treaty of 1860, had also opened the door for a great extension of international commerce.

To these encouragements was added another of special importance in considering the growth of the Continental cotton industry during the last forty years—the substitution of power looms for hand-looms. In 1860, as already stated, this change had been all but completed in England, but it had then made comparatively little progress on the Continent. From that year the process became more rapid, and it was greatly accelerated after the conclusion of the Franco-German War. Thenceforward the hand-loom disappeared year after year; and yet even now it is not altogether banished, for there are many thousands of cotton hand-looms still at work in Russia, Austria, Hungary, Italy, Germany, and even in France. The important consideration is that this process of displacing handicraft by machine weaving created throughout the Continent, as it did in Great Britain at an earlier period, a greatly

increased demand for yarn, and required a large addition to the number of spindles, and to the consumption of raw cotton on the Continent.

This expansion is, of course, only partly due to the progress of mechanical weaving. It is in large measure the result of the growth of population and the improvement of the economic condition of the people throughout Europe during the last thirty or forty years. In so far, however, as it is a result of the conversion of handicraft into machine weaving, it is a process which, once accomplished, cannot be repeated. For this reason it is not to be expected that the progress of the European cotton industry, measured by the quantity of cotton consumed, can be anything like so great in future years.

It is further to be noted that the Continental cotton industry is still mainly engaged in supplying the home markets. It has never yet been able to compete seriously, except in the case of a few relatively unimportant descriptions of goods, with the productions of Lancashire in the neutral markets of the world. Several reasons may be adduced for this disability, and not least amongst them is the protectionist systems of the Continental countries, which by enhancing the prices of many miscellaneous requisites of the industry, go far towards enhancing the cost of production. This consideration opens up, however, a large question into which we cannot enter now.

One of the most remarkable developments of the cotton industry in foreign countries within the last twenty years is the extraordinary increase in the number of spindles and looms at work in the Southern United States. The progress there within the last twenty years is strikingly shown in the following table, giving the consumption of cotton in the South since 1880 :—

CONSUMPTION OF COTTON IN THE AMERICAN SOUTHERN STATES.

		Bales.
Annual average	1876–1880	163,800
,, ,,	1881–1885	269,200
,, ,,	1886–1890	452,600
,, ,,	1891–1895	716,600
,, ,,	1895–1900	1,233,000
Year	1900–1901	1,667,000
,,	1901–1902	1,947,000

The marvellous expansion here indicated may be traced to a combination of forces. Until 1875 the spinning mills of the South were largely engaged in producing yarn, partly for the hand-looms in the Southern States, then gradually disappearing, and still more for the power looms which were superseding them. According to the census of 1879–80, there were 12,360 power looms in the Southern mills. But in 1900–1 these had increased to 122,902, and the number is now considerably larger. Within the same interval the number of spindles in the South grew from 561,360 to 5,819,835. At first the production of manufactured cotton goods was entirely consumed at home; but within the last fifteen years the Southern mills have been making cotton cloth for export, chiefly to China, in the northern part of which, and particularly in Manchuria, they have forced their way with little difficulty in almost constantly increasing quantity. These goods are, however, entirely of the coarser and heavier kinds; and the Southern mills have not been able to compete at all appreciably with those of the North, nor with English mills, in respect of the finer and more elaborate descriptions. The secret of their success is not proximity to the source of cotton supply, for the cost of transporting raw cotton to the Northern mills and to Lancashire, which is about the same in both cases, is not much greater than that of conveying it to the manufacturing districts in North and

South Carolina. It is mainly the consequence of a previously unutilized source of labour supply. The emigration from the Northern to the Southern States since the War of Secession, more than thirty years ago, of many white settlers on the land created a considerable farming population, from which the factory labour force of the Southern mills has been abundantly recruited. The workpeople, thus tempted from the land to the factory, have hitherto been content to work at much lower rates of wages than those paid in the Northern mills or in Lancashire, and for more hours per day. This is the main reason for the remarkably successful competition and the very rapid growth of the Southern cotton mills in recent years. It has been aided, too, by the absence of factory legislation in the Southern States. Well-informed people are of opinion, however, that these special advantages hitherto possessed by the millowners in that part of the United States are now coming to an end.

In the Northern American States the cotton industry has undoubtedly been making great progress within the last twenty years. The competition of the South in respect of coarse and cheap descriptions has forced the managers of the Northern mills to diversify and raise the quality of the goods they produce; and the improved taste of consumers has contributed, as in England, toward bringing about this change. In the main, however, the American cotton industry is engaged, as is that of Continental Europe, in producing for the home market.

The cotton industry of England still holds its foremost place as a producer for the open markets of the world. Foreign competition has impeded, but it has not stopped, its progress, and there is no evidence of its arrest or decadence. It has the advantage of a highly favourable climate in Lancashire, a well-trained and industrious

body of workpeople, directed by experienced and highly skilled management, and supported by an admirable commercial organization, which embraces every market in the world. It has at present the encouragement of a national fiscal system which enables it to obtain all the requisite materials and necessaries required in the industry at the lowest possible prices—lower, indeed, than its competitors in other countries can command. Whatever future changes may occur, therefore, to help or hinder its cause, there is no reason to doubt, still less to despair, of its continued progress, so long as it is allowed to enjoyed the benefits of Free Trade.

THE WOOLLEN AND WORSTED INDUSTRIES OF YORKSHIRE

Frederick Hooper

IN dealing with this subject, it is necessary at the outset to give you some idea of the relative positions of the towns in Yorkshire in which the woollen and worsted industries are carried on.

All the textile manufacturing towns are situated in the West Riding, and they are all within a radius of fifteen miles of Bradford. With the exception of Manchester and Liverpool, this is the most densely populated district in the provinces—it includes a population of nearly two million persons.

Of the persons engaged in the woollen and worsted industries of Yorkshire, 53,000 are employed in the city of Bradford and its immediate vicinity, 13,000 in Huddersfield, 12,200 in Halifax, and 11,700 in Leeds. In the remaining towns the persons employed range from 7000 at Keighley to 600 at Otley.

It will thus be seen that Bradford is by far the most important textile manufacturing town in Yorkshire. As a matter of fact, it is the largest wool manufacturing town in the world. Bradford has been designated, and justly so, as "the metropolis of the worsted industry." It is, in fact, the centre of the wool and worsted trades, probably five-sixths of all the wool consumed in the United Kingdom being dealt with in one form or another in Bradford.

You will notice that I said *wool* and worsted trades—not *woollen* and worsted. By this I mean that Bradford is the chief market for raw wool and the centre of the worsted trade. The *woollen* trade is entirely distinct from the worsted trade. Bradford, Huddersfield, Halifax, and Keighley are the principal Yorkshire towns engaged in the worsted industry; and Leeds, Batley, Dewsbury, and Morley the principal towns in the woollen trade.

Before going further, it is necessary to explain the difference between woollen and worsted.

There are four great industries in which wool is the principal raw material used, viz. the worsted industry, the woollen industry, the carpet industry, and the shoddy industry. There is another industry which belongs partly to the woollen and partly to the worsted industry—I mean the hosiery. This, however, is not carried on to any great extent in Yorkshire, except as regards the spinning of hosiery yarns, which is a large and growing industry.

The difference between woollen and worsted lies, firstly, in the character of the wool used, and secondly, in the processes through which the wool goes before it becomes yarn, and consequently in the character of the yarn when spun and ready for the loom.

You are, no doubt, aware that there are several varieties of wool, the difference depending mainly upon the breed of the sheep by which the wool is grown, and climatic influences, etc. Some wools are long, others short; some are fine in fibre, others coarse; some have a glossiness (or "lustre," as it is called), others are dull. These different classes of wool are used for different purposes, but I cannot now enter into particulars.

In the woollen industry, short wools, the fibres of which vary from say $\frac{1}{4}$ of an inch to $3\frac{1}{2}$ inches, are used; whereas in the worsted industry only long wools, ranging in length up to 14 or even 17 inches, are utilized.

When examined under the microscope, a *cotton* fibre has the appearance of a twisted flattened ribbon; *silk* appears as a transparent rod; and *flax* resembles a bamboo. A *wool* fibre, on the other hand, appears to be built up like a fir-cone, *i.e.* the surface is covered with small serratures which overlap one another. These serratures (which point towards the tip, or outward end, of the fibre) are more numerous in short wools than in long, and form a very important feature in the woollen manufacture, both as regards the *spinning* qualities and the *felting* properties of the wool.

Roughly speaking, woollen goods are made from wool which has been *carded;* worsted goods from wool which has been carded *and combed,* or combed only.

In the woollen carding process, which, as I said, is adapted to short wools, the fibres are made to overlap one another—to become entangled as it were. This is aided by the serratures which I just mentioned. In the finished woven piece the serratures of one fibre become interlocked or felted with those of other fibres, and thus bind the whole into a compact mass.

In the combing process (one part of which is very similar to the operation performed by a girl when combing her hair) the object is to induce the fibres to lie as straight and as parallel as possible. Only long wools are adapted for combing.

To sum up, *woollen* goods are made chiefly of short-stapled wools, the fibres of which in the finished article cross and recross each other; whilst *worsted* goods are made of long-stapled wool, the fibres of which lie parallel one with another. If you look through a magnifying-glass at a piece of woollen cloth, you are not able to distinguish the two yarns (warp and weft) of which it is composed, the cloth having a matted appearance; whereas if you in the same way examine a

piece of worsted material, you can easily distinguish the two yarns—the make or "weave," as it is termed.

Shoddy, as you are perhaps aware, is re-manufactured wool. It is made from woollen garments, tailors' clippings, stockings, etc., which are put through various processes, reducing the wool almost to its original condition, after which it is mixed with a little pure wool, and sometimes with cotton, spun into yarn and woven into cheap woollen clothing material. This industry is carried on around Batley and Dewsbury chiefly.

Carpets are made from strong coarse wool. The yarn is generally constructed in the same manner as worsted yarn, but is, of course, much thicker. Only the surface of the carpet is of wool, the backing being of jute, hemp, or cotton. In Yorkshire, carpets are made at Heckmondwike and Halifax chiefly.

Reverting to the worsted industry, I ought to point out that although wool is the foundation of that industry, other textile fibres are largely used, *e.g.* cotton, mohair, alpaca, and silk, as well as camels' hair, cashmere, and ramie. *Cotton* is used for the warp only, the wool, mohair, alpaca, etc., forming the weft. Cotton was at first, no doubt, used to cheapen the goods, when the price of wool was much higher than it is now, but at the present day cotton is used chiefly to give lightness and strength to the fabric. In woollen goods, however, cotton is often used as an adulterant. *Mohair* is the hair of the Angora goat, and comes mainly from Turkey and the Cape. It is a long, silky, lustrous fibre, its price being roughly about double that of the best wools. Mohair is the most lustrous fibre after silk, alpaca being next, and Lincoln wool next. In the better qualities of mohair goods, silk is sometimes used for the warp. *Alpaca* is the hair of the llama—a native of Peru. Only a comparatively small quantity of this

material is available. It is largely used for making braids, and is also mixed with mohair—indeed mohair goods are generally known as "alpacas" by ladies. The *silk* industry, of course, stands by itself. I may mention in passing, however, that in Bradford we have the largest silk mill in the world—that of Messrs. Lister and Co., Ltd., originally built by the present Lord Masham, the inventor of silk plush-making and various other industrial processes. This mill occupies eleven acres of ground, and employs from 4000 to 5000 workpeople.

Before leaving this part of my subject, it will perhaps be interesting if I mention the different classes of goods produced in each district.

In the Bradford district we produce mostly high-class dress goods (for ladies' ordinary and evening wear) of worsted, mohair, and alpaca, also mixed with silk. We also produce worsted coatings and trouserings, worsted and cotton linings, and upholstery materials. Generally speaking, the Bradford trade is a high-class trade.

Huddersfield and Halifax produce chiefly worsted coatings, suitings, and trouserings, similar to those of Bradford. Huddersfield is noted for trouserings and suitings. Halifax makes carpets also.

Leeds and Morley produce woollen coatings, suitings, and trouserings, and meltons, beavers, etc., as well as woollen goods for ladies' wear. They also make worsteds and tweeds.

Batley and Dewsbury, which are the principal seats of the shoddy industry, produce cheap goods for men's wear, and cheap mantle cloths, etc., for women's wear These goods have a very presentable appearance, but do not wear so well as pure worsteds or woollens. They are, however, classed as woollen goods, and being very cheap and warm, have proved a great boon to the lower classes. Woollen rugs are also made in this district.

Outside the West Riding, and particularly amongst our Consuls abroad, there appears to be a general impression that the whole of the processes connected with the manufacture of wool—from the sorting of the wool up to the dyeing and finishing of the woven material—are carried on in the same mill. It will, therefore, be useful to mention here, that in the worsted industry there are very few mills indeed, probably not half a dozen in the whole of the West Riding, in which the wool goes through all stages. In the vast majority of cases each stage of manufacture is a separate branch of industry, *e.g.* in the worsted industry—

(1) The wool-merchant buys his wool, and after "sorting" and blending it into different qualities, sends it to

(2) the woolcomber to be combed into "tops" of different kinds;

(3) the "tops" are bought by the spinner to be spun into yarn of various descriptions;

(4) the yarn is bought by the manufacturer and woven into pieces in accordance with orders which he has received from the merchant;

(5) the pieces are delivered to the merchant, generally "in the grey," as it is called, *i.e.* the state in which they leave the loom, and are by him sent to

(6) the dyer, to be dyed certain shades and "finished" according to the make of the cloth;

(7) the pieces are then distributed over the whole world by the merchant.

There are, of course, variations on the above, *e.g.* some mills perform two, three, or even more, of the above processes; but generally speaking there are, as already stated, in the worsted industry very few mills indeed in which the whole of these processes are carried on. Then, again, the "tops" and yarns are bought in large quantities for export to foreign countries. In the woollen industry it is more common for the carding, spinning, and weaving

processes to be carried on in the same mill; but as a rule woollen mills are very much smaller than worsted mills.

Before going further, I should point out that, as you probably understand, all the operations to which I have alluded are performed by machinery—there is no carding, combing, spinning, or weaving done by hand in Yorkshire, though the general introduction of machinery dates back some eighty years only.

The number of persons employed in 1901 in the textile factories of Yorkshire is set forth in the following table:—

Age:—	Under 15.		15–24.		25–44.		45 and upwards.		Total employed.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
WOOL & WORSTED.										
Sorting processes ...	12	11	676	70	1756	26	1298	7	3742	114
Combing processes	154	76	2023	2052	3566	976	2096	130	7839	3234
Spinning processes	6681	8834	5287	17247	3208	3105	1554	297	16730	29483
Weaving processes	840	1853	3640	27917	7925	15198	5226	2137	17631	47105
Workers in other processes ...	1641	801	8247	4969	12137	2078	6656	292	28681	8140
	9328	11595	19873	52255	28592	21383	16830	2863	74623	88076
COTTON AND FLAX	2158	2359	5630	10841	7530	4345	3813	1175	19027	18242
SILK.										
Spinning processes	240	549	148	1738	181	494	75	36	644	2817
Weaving processes	54	89	98	878	249	520	116	61	517	1548
Workers in other processes ...	152	96	592	391	744	125	208	14	1696	626
	446	734	838	3007	1174	1139	399	111	2857	4991
HEMP & OTHER FIBROUS MATERIALS ...	122	85	301	622	396	118	395	23	1214	848
MIXED OR UNSPECIFIED MATERIALS ...	386	653	1039	3733	1721	1379	1181	266	4327	6031
BLEACHING, PRINTING, DYEING, ETC.										
Textile bleachers ...	20	4	89	37	163	6	15	1	387	48
Textile printers ...	61	8	216	56	250	22	82	1	609	87
Textile dyers ...	210	19	3209	182	5750	71	2715	5	11884	277
Textile calenderers, finishers, etc.	19	9	131	77	207	20	98	4	455	110
	310	40	3645	352	6370	119	3010	11	13335	522
DEALERS.										
Drapers, linen drapers, mercers	185	156	2416	2701	2908	1185	1501	176	7010	4218
Other dealers in textile fabrics ...	21	11	642	69	1943	60	1461	26	4067	166
	206	167	3058	2770	4851	1245	2962	202	11077	4384

I will now begin with the raw material and trace its progress upwards, through the various branches of industry until it emerges into the finished article and is distributed, not only throughout the United Kingdom, but over the whole world.

Some firms who comb and spin, import wool from abroad—from the Colonies chiefly—but, generally speaking, the wool is imported by wool-merchants or consigned by growers to London, Liverpool, or Hull, and bought there by the wool-merchants. I will leave the merchanting system for the present and deal first with the industrial processes.

Wool-sorting.—The first of these processes is the "sorting" of the wool. Wool-sorting consists of spreading out, on a perforated board, a clipped fleece of wool and sorting it by hand into grades, according to length of staple, fineness of fibre, and state of cleanliness. There are as many as eight qualities in a fleece, and a considerable amount of technical knowledge is required to classify the different qualities quickly and accurately. The employment is restricted to men-workers.

Combing and Carding.—The next stage is the preparation of the raw wool for spinning into yarn, *i.e.* the *carding* for woollens and the *combing* for worsteds. In both carding and combing the first process is the "scouring," *i.e.* the washing of the wool, in order to remove the natural grease and other impurities. This is done in a series of tanks or bowls. These being filled with water, steam is injected until the water is heated to about 120°; soap is then put into the bowls in a liquid form, together with some mild alkali. The wool passes from one bowl to another by means of mechanical contrivances, the liquid being pressed out at each stage by means of rollers. It is finally thrown into a bin, by which time it is quite clean. English wools will yield

as much as 70 to 80 per cent. of pure wool after washing; Australian greasy wools yield 45 to 55 per cent; whilst American territory wools yield only 30 to 35 per cent. Therefore it is a point of extreme importance for a buyer to be able to estimate the yield of pure wool from an unwashed fleece.

In the combing process the wool passes through various machines until it finally emerges in the two states of "top" and "noil." The "top" consists of the long fibres arranged in a "sliver," or loose rope, with all the fibres parallel, while the "noil" consists of the short hairs which are taken out in the process of combing, together with such extraneous matter as cannot be washed out. These noils or short hairs are used in the woollen industry for making blankets, flannels, etc.

In the woollen industry the carding and the spinning and often the weaving as well, are, as already stated, generally carried on in the same mill; but in the worsted industry the combing is a separate branch of industry, there being many firms who do nothing but comb "on commission," *i.e.* they receive the wool from the wool-merchant and comb it into "tops" in accordance with instructions received, and then deliver the tops and noils to the owner of the wool or his customers. In the combing industry the persons employed are both men and women, but men predominate largely, as will be seen from the table given above. In this industry, when work is plentiful, the combs run night and day, but men only are employed at night.

In the combing industry (and also in the dyeing) a plentiful supply of soft water is necessary, and the Bradford Corporation have spent very large sums of money in providing an ample supply of such water. Quite recently £1,500,000 was spent for this purpose.

The sewage of Bradford is probably the most

difficult to treat of any in the world. This is due to the presence in the whole bulk of it of wool-combers' suds, containing lanoline and other fatty matters. Already over £250,000 has been spent in efforts to deal with these suds, and the corporation are now considering the question of providing separate sewers for wool-combing works, or having the effluent treated separately at each works. Professor Dewar states that "it is absolutely impossible, by any known method of precipitation, to deal with the Bradford sewage mixed with crude suds."

Spinning is the next process. In the woollen industry this, as already stated, is generally carried on in conjunction with the previous processes, and of course in the same mill; but in the worsted trade the spinning is generally a distinct branch of trade. Some spinners, it is true, sort, comb, and spin; but in many cases, especially in the smaller concerns, the spinner buys his tops from the top-maker, spins his yarn, and sells the yarn to the manufacturer or the export yarn merchant.

The first stage of the spinning process (in worsted yarns) is the *drawing*. This comprises a series of eight or ten operations, gradually reducing the thickness of the sliver or top. The spinning process is an extension of the drawing process, and produces the thread or yarn. It is conducted in several different ways. When I mention that some yarns are no thicker than sewing cotton, you will understand that the manipulation of the yarn is a very delicate process. Yarns for *weft* are put upon small spools for the home trade; for the foreign trade they are often put on tubes, or made up into hanks. *Warp* yarns, which are usually two-fold, *i.e.* composed of two threads twisted together, are reeled upon bobbins, and are afterwards put upon large rollers (known as weavers'

beams) in a convenient form for weaving. Weft yarns, however, are not always "single," but are frequently 2-fold, 3-fold, and even 4-fold. A spool or a hank of weft yarn contains 560 yards of single yarn, and the counts or thicknesses of the yarn are regulated by the weight of yarn on the spool; *e.g.* 10^s count means that 10 hanks or spools of 560 yards each weigh 1 lb., 20^s means that 20 hanks weigh 1 lb., and so on; the thicker the yarn the lower the number, and the fewer hanks to the pound of course. Young women and boys are largely employed in the spinning processes.

Weaving is the next process. This, of course, is the art of producing cloths of various kinds and patterns by the interlacing of weft and warp yarns. In the worsted industry the weaving (or "manufacturing," as it is called) is, generally speaking, a separate industry. The manufacturer buys his yarn from the spinner and weaves it into pieces. In many cases the manufacturer confines himself to one kind of cloth; *e.g.* one manufacturer will make only mohair goods, another cotton-warp dress goods, or all-wool dress goods, a third will make coatings, a fourth trouserings, a fifth linings, and so on, each particular make being a speciality of one or more manufacturers, who thus devote their whole energy, and often the experience of a lifetime, to the production of one particular kind of material. In the weaving industry of Bradford young women are mostly employed; in Huddersfield and the heavy woollen districts men are largely employed.

The next stage, perhaps the most complicated of all, is the *dyeing and finishing* of the woven pieces. Every piece made has to go through the process of dyeing or finishing. Some cloths (coatings and trouserings, for instance) are made from yarns which have been dyed either in the yarn or in the washed wool stage, before

weaving, and such cloths require "finishing" only; but in the vast majority of cases the goods are dyed in the piece, that is to say, the pieces are woven white, or "grey," as it is termed technically, and are afterwards dyed and finished by the piece-dyer. Some of the Bradford dyeing establishments are huge concerns—Messrs. Ripley's, for instance, covers an area sufficient for many a small English town. One essential requirement for a dye works is a plentiful supply of suitable water. Many of the dyeing establishments have their own wells; but in spite of this, and notwithstanding that the water is used over and over again as far as practicable, one dyeing firm in Bradford is said to pay the Bradford Corporation something like £10,000 per annum for the town's water used by them. Of late years very great progress has been made in the arts of dyeing and finishing. Dyeing may be said to be a scientific process, requiring as it does the constant services not only of trained men, but of trained chemists. Briefly, the process is this: the pieces when received in the grey are stitched together, forming lengths of from 200 to 500 yards, and are passed through boiling liquors and subjected to a thorough saturation by steam at high pressure, to prevent their shrinking and crimping in the real dyeing process. They are then dried, and at a very rapid speed passed over red-hot plates, to burn off any loose fibres; this is called "singeing." They are then dyed such shades as may be ordered, and afterwards undergo treatment of various kinds to give them the desired "finish." The pieces are finally "made up" for the merchant's stock-room or the draper's window. I should mention here that the dyers, like the wool-combers, work entirely "on commission," that is to say, they do not dye their own goods, but perform the work for other people—for the manufacturers of the goods sometimes,

but generally for the merchants. They charge so much per yard, or so much per piece generally. Men mostly are employed in the dyeing industry; owing to the heavy weights that have to be manipulated, and to the general character of the work, women are unsuitable.

Ready-made Clothing.—A branch of the woollen trade is the ready-made clothing industry, which is carried on in Leeds chiefly. This is not, as might be supposed, a domestic industry, but is carried on in factories, some of which employ upwards of a thousand hands. Probably three-fourths of the persons employed are women.

Having thus briefly, but very imperfectly, described the industrial processes, I now come to the *merchanting*. Bradford is the chief centre for this, though the merchanting of pieces is also carried on, but to a smaller extent, in Huddersfield, Leeds, and Halifax. The merchanting system of Bradford, which I am about to describe, may be taken, so far as regards piece-goods, to be typical of the other places in the West Riding where such business is carried on.

The *merchanting* system is of comparatively modern growth in Bradford. Wool merchants are said to have existed in Bradford for very many years, though it is difficult to find any early records of them, but other classes of merchants were unknown up to the beginning of last century. In the first Bradford Directory, issued about 1804, only one stuff merchant is named (he was also a celebrated maker of cork-legs); and in the Directory for 1814 only two are mentioned. Both of these, of course, were home trade merchants. At that time the bulk of the merchanting was done at Leeds, Halifax, or Wakefield, though most of the then stuff manufacturers in the neighbouring districts attended the Bradford market with their goods.

The pieces were purchased in the state in which

they left the looms, and were afterwards, by the merchant's instructions, collected by the dyers—mostly from Leeds and Halifax. Up to about 1810 there were only two dyeing establishments in Bradford; but by 1830 several others had been started. Bradford had by this time become "the metropolis of the worsted industry," and it was only about this time that the merchanting system really took root in the town. A few enterprising Scotchmen then settled in Bradford and developed the "home trade," whilst German and other foreign merchants, who had previously had their headquarters in Leeds or Manchester, or had bought abroad through agents, began business in Bradford, and opened up the foreign trade in pieces, and, later on, in yarns and tops. A considerable number of these foreign merchants afterwards settled in Bradford, and have proved valuable acquisitions to the town. Bradford owes much to these firms, for it was, in the first instance at any rate, mainly by their enterprise that Bradford goods were introduced into all parts of the globe.

There are, of course, large numbers of merchants in Bradford dealing in a variety of articles, but the principal classes of merchants connected with the textile trade are (1) wool merchants, (2) mohair and alpaca merchants, (3) top and noil merchants, (4) yarn merchants, and (5) piece merchants.

The *wool merchant* (or wool-stapler, as he was formerly styled) is probably the oldest class of merchant existing in Bradford. Up to the beginning of the nineteenth century the wool consumed in this country was almost entirely home-grown. In those days the manufacturer himself generally purchased in the wool-producing districts, and, after having had the wool combed and spun, gave out the yarn to be woven into

—combing, spinning, and weaving being at that

time done by hand, instead of by machinery, as at present. To-day the wool merchant not only visits all the wool-producing districts of the United Kingdom, besides attending the sales of colonial and foreign wools held periodically in London, but also imports wool from abroad, and, after "sorting" it, sells it to the consumer or the export merchant, or has it made into "tops" for sale to the spinner or export top-merchant. Some wool merchants deal only in English wools, others confine their attention to foreign and colonial wools, whilst others deal in both kinds. Others, again, make a speciality of "short" wools and "noils"—the short fibres taken out in the process of combing.

Since 1860 the quantity of wool imported from abroad has been largely in excess of that produced at home, as will be seen from the table on page 108.

The development of the last forty years may be briefly summed up as follows:—

	1860.	1902.
Home-grown wool ...	140 million lbs.	135 million lbs.
Imports of wool and hair	137 ,, ,,	674 ,, ,,
Together ...	277 ,, ,,	809 ,, ,,
Exported	42 ,, ,,	321 ,, ,,
Balance available for home consumption	235 ,, ,,	488 ,, ,,
Estimated value	£20 millions.	£15 millions.

At the prices of 1860, the wool consumed in 1902 would be worth about £40 millions.

The *mohair merchant* imports mohair from Turkey and the Cape, and, after sorting it, sells it to spinners of mohair yarn. Some mohair merchants deal only in Turkey mohair; others deal in both Turkey and Cape. Mohair was hardly known as an article of commerce before 1835.

The *top merchant* makes or buys his tops and exports them to foreign countries or sells them to

QUANTITIES OF WOOL, MOHAIR, ALPACA, ETC.,

Imported into, exported from, and consumed in, the United Kingdom.
(In millions of lbs.)

Year.	Foreign and Colonial Wools.					Domestic Wools.			Total quantity retained in the United Kingdom.	Population of the United Kingdom.	Quantity of wool, etc., retained per head.
	Sheeps' and lambs' wool imported.	Mohair, alpaca, vicuna, etc., imported.	Rag-wool imported.	Wool, etc., re-exported.	Balance retained.	Total clip (estimated).	Exports.	Balance retained.			
	Millions of lbs.					Millions of lbs.			Million lbs.	Millions.	lbs.
1775	2	—		—	2	80	—	80	82	13	6¼
1800	9	—		—	9	90	—	90	99	16	6¼
1820	14	—		—	14	100	—	100	114	21	5⅜
1825	23	—		—	23	110	1/10	110	133	22½	6
1830	32	—		—	32	115	3	112	144	24	6
1835	42	1	Included with wool previous to 1860.	4	39	120	4½	115	154	25½	6
1840	53	2		1	54	120	5	115	169	27	6¼
1845	77	3		2	78	125	9	116	194	27½	7
1850	74	4		14	64	130	12	118	182	27½	6⅔
1855	98	4		29	73	135	16	119	192	28	7
1860	131	6	15	31	121	140	11	129	250	29	8⅝
1865	209	8	21	82	156	150	9	141	297	30	10
1870	259	7	39	92	213	150	9	141	354	31	11⅜
1875	361	10	57	172	257	162	11	151	408	33	12⅜
1880	461	17	92	238	332	149	17	132	464	34½	13½
1881	448	13	79	266	274	138	14	124	398	35	11
1882	485	21	84	264	326	129	14	115	441	35½	12⅜
1883	494	15	80	278	311	128	19	109	420	35½	11⅞
1884	519	25	69	278	335	132	18	114	449	35¾	12⅝
1885	501	19	73	269	324	136	23	113	437	36	12⅛
1886	593	24	68	311	374	136	22	114	488	36½	13⅜
1887	573	23	71	320	347	134	20	114	461	36½	12⅝
1888	635	26	71	340	392	134	24	110	502	36½	13¾
1889	696	26	71	365	428	133	22	111	539	37¼	14½
1890	629	20	77	342	384	138	29	118	502	37½	13⅛
1891	715	25	83	385	438	147	17	130	568	37¾	15
1892	738	25	57	431	389	153	18	135	524	38	13¾
1893	673	25	73	347	424	150	16	134	558	38½	14½
1894	701	24	69	346	448	142	13	129	577	38¾	14⅞
1895	771	30	85	405	481	135	22	113	594	39	15
1896	714	22	82	335	483	136	18	118	601	39½	15¼
1897	736	31	74	372	469	139	40	99	568	39¾	14⅜
1898	695	28	68	283	508	138	12	126	634	40	15⅞
1899	663	34	73	293	477	140	23	117	594	40½	14⅝
1900	553	27	69	196	453	141	25	116	569	41	13⅝
1901	687	28	67	294	488	138	20	118	606	41½	14⅝
1902	638	40	74	285	467	135	36	99	566	42	13½

spinners. The export trade in tops is, comparatively speaking, a new trade. In 1882 (the first year for which statistics are available), the exports of tops, noils, and waste amounted to only £90,000, whereas last year the exports of tops alone amounted to £2,850,000.

The *yarn merchant* is engaged in the foreign trade exclusively. It is true that a few merchant firms sell yarn to Bradford manufacturers, but these firms are mostly agents for Continental spinners or for Lancashire cotton spinners. It is worthy of note that this country imports annually from Belgium, Germany, and France woollen and worsted yarns to the value of over £2,000,000 sterling. This, however, is a class of yarn either not spun in Bradford, or which it would not at present pay Bradford firms to spin. The export trade in yarns ranks next in importance to that of pieces. In 1877 (twenty-five years ago) the value of yarns exported was £4,200,000; in 1902, although the quantity was exactly double that of the earlier period, the value was only £5 millions. At the prices of 1877 it would have been worth about £8½ millions. Germany takes two-thirds of our entire exports of yarn, the remainder going to other Continental countries chiefly.

The Bradford *piece merchant* deals not only in the worsted, mohair, and silk goods (including plushes and velvets) manufactured in the city and district, but also in the worsted suitings and coatings of Huddersfield and Halifax, the woollen goods of Leeds, Dewsbury, and Batley, and the carpets, blankets, etc., of Halifax, Heckmondwike, and other places; in fact, probably two-thirds of the entire textile productions of the West Riding are merchanted in Bradford. In addition to these articles, Bradford merchants have also a considerable trade in cotton goods, manufactured in Lancashire, but dyed and finished, and sometimes "mercerized,"

in Bradford. It must not be supposed, however, that the piece merchant is merely a middleman between the producer and the customer. In Bradford the merchant undertakes many of the functions of the producer. Frequently he not only suggests the fabric to be made, but, on receiving the goods from the manufacturer, generally in the state in which they leave the loom, orders them to be dyed, embroidered, or otherwise treated in such styles as his experience teaches him will suit the numerous markets with which he trades. If time permitted, I could show that in several cases Bradford merchants were the means of introducing new fabrics which at the time gave a distinct impetus to the Bradford trade.

Piece merchants may be divided into two great classes, viz. home trade merchants and export (or foreign) merchants. The functions of each class are to a certain extent alike, the main distinction between the two being that the former confines his operations to the four divisions of the United Kingdom, whilst the latter deals only with countries outside our own borders. Some piece merchants do both a home and a foreign trade, whilst others (engaged in the foreign trade chiefly) deal not only in pieces, but in yarns and tops as well. In such cases, however, the different branches of trade are kept quite distinct, and are usually carried on under separate management.

The home trade merchant buys from the manufacturer, and, by means of travellers, each of whom takes a certain district, sells to warehousemen and wholesale dealers in London, Manchester, Glasgow, and other parts of the country. These warehousemen re-sell the goods to drapers and retailers generally in all parts of the kingdom; it thus frequently happens that goods manufactured in Bradford are forwarded to London and are bought there and brought back to Bradford by

local dealers. The home trade merchant, as a rule, holds large stocks, so as to be in a position to supply his customers at short notice.

The export merchant likewise buys the pieces direct from the manufacturers, and after having had them dyed and finished, etc., and made up to suit the foreign market, exports them to foreign countries, the Colonies, etc.

The following table, giving the values of the exports of woollen and worsted goods to the principal countries abroad, shows how the export trade in pieces has changed during the last thirty years.

EXPORTS OF WOOLLEN AND WORSTED TISSUES (VALUES).

	Woollen tissues.		Worsted tissues.	
	1873.	1902.	1873.	1902.
	£	£	£	£
To Sweden and Norway	211,072	46,782	65,214	48,332
,, Germany	948,106	518,746	2,857,377	355,313
,, Holland	176,380	233,845	551,336	181,858
,, Belgium	153,150	516,058	311,287	219,705
,, France	870,822	719,404	2,252,945	733,302
,, Portugal	—	16,992	102,829	20,078
,, Spain	20,541	34,148	31,874	119,432
,, Italy	147,602	81,756	547,146	180,836
,, Turkey	15,703	207,768	241,583	93,920
,, China and Hong Kong	291,469	126,796	821,439	249,966
,, Japan	132,873	201,632	170,919	266,798
,, United States ...	1,197,438	408,748	3,941,476	877,282
,, Peru	181,255	73,303	72,283	25,726
,, Chile	107,133	106,863	136,534	167,048
,, Brazil	182,957	82,534	188,933	100,750
,, Uruguay	71,600	26,305	37,509	45,553
,, Argentine Republic	190,006	123,593	159,796	164,047
,, British Possessions in South Africa	58,765	155,820	36,394	242,631
,, British East Indies...	218,007	221,444	119,842	202,781
,, Australia ... ... ,, New Zealand ...	538,855	375,930 / 106,743	798,900	617,368 / 168,283
,, British N. America	418,053	538,354	339,517	814,304
,, Other countries ...	467,848	579,465	492,249	472,587
Total £	6,599,635	5,503,029	14,277,382	6,367,900

The figures for 1873, however, are not absolutely reliable, and in comparing the two years it should also be borne in mind that prices in 1902 were very much lower—probably 50 per cent. lower—than in 1873. Yorkshire goods, and especially Bradford goods, have been the sport of tariff-makers nearly all the world over, and this table shows the result. With a fair field and no favour, Yorkshire merchants and manufacturers together could compete with any other place in the world; but the prohibitive tariffs now in force in many countries—some of which were formerly our best customers—effectually exclude the bulk of our productions. Thus, whilst we imported last year from France alone £4½ millions worth of dress-stuffs similar to those made in Bradford, all we could manage to send to that country in return was about £700,000 worth, this being due, of course, to the prohibitive import duties.

The value of the woollen and worsted goods produced in the United Kingdom is about £58 millions, of which about £42 millions must be credited to Yorkshire. The turn-over in Bradford of wool and its manufacturers amounts to about £100 millions.

With the exception of the wool-combing and the dyeing, with which I will deal immediately, the concerns in the various branches of trade which I have described are carried on by private firms. Some of these, it is true, have been converted into limited companies; but in the spinning, weaving, and merchanting there has been no syndicating, as in the two branches just named. Some years ago, when combinations were in the air, attempts were made to form a combination of fine spinners and another of fancy manufacturers, but they did not succeed.

The first large combination in Yorkshire was the Bradford-Dyers' Association. I will leave this for the

present. The British Cotton and Wool Dyers' Association followed. This association has a capital of £3 millions, and includes forty-five firms, *i.e.* the majority of the concerns in Lancashire, Yorkshire, and Scotland engaged in "slubbing" (*i.e.* wool or "top" dyeing) and yarn dyeing. A further dyeing combination was the Yorkshire Indigo, Scarlet, and Colour Dyers' Association, which includes all the firms in that special branch. The Yorkshire Woolcombers' Association, which has figured so prominently in the newspapers of late, was formed in 1899. It absorbed thirty-eight combing establishments in Bradford and district, and has a capital of about £2 millions. The work is done entirely on commission.

The *Bradford Dyers' Association* was formed in 1897. It has a capital of £4,250,000. It has absorbed thirty-five separate businesses, and has practically secured a monopoly of the Bradford piece-dyeing business. The combination was formed with a view to putting an end to the ruinous competition that had previously prevailed, and placing the dyeing trade on a more profitable basis. At the same time the originators of the combination declared that they had no intention of raising prices to the detriment of the trade. This association is the only really successful combination in the Yorkshire textile trade.

The fear that the Association having "a giant's strength" might "use it like a giant" led to the formation a few months ago of the *Bradford Piece-dyeing Board*—a body composed of representatives of the Bradford Dyers' Association and representatives of their customers. The Board consists of twenty-three members, twenty elected by the Bradford Chamber of Commerce, and three by the Dyers' Association. The functions of the Board are (1) to adjust and settle differences arising

between the Bradford Dyers' Association and its customers, which may be referred to the Board for settlement, and (2) the consideration of questions affecting the relationships between the Association and its customers or their mutual interests.

In the rules it is provided that the voting power of each side should be equal, and that in case of disagreement each side may meet separately to discuss the matter in dispute. If on coming together again the two sides cannot agree, the matter is to be referred to a standing arbitrator. Several matters have been brought before the Board, but these have been adjusted without having to make use of the services of the standing arbitrator.

The Board has been in existence for so short a time that it can hardly be said to have emerged from the experimental stage yet, but it possesses great possibilities, providing as it does the means of ventilating grievances and remedying such grievances before they have reached an acute stage.

I should add that in connection with the Bradford Dyers' Association there is a *Wages Board*, on which both the Association and the workmen's societies are represented. This Board not only fixes standard rates of wages for the different branches of dyeing work, but also considers other matters affecting the industry. By its means many questions have been amicably discussed and settled, any one of which might otherwise have given rise to serious friction, or even to strikes and lockouts.

Before leaving this part of my subject, I should like to refer to three other institutions in Bradford, which, though not part of the textile industries, are yet closely connected with them. I refer to the Bradford Chamber of Commerce, the Bradford Conditioning House, and the Bradford Board of Conciliation.

The work of the *Chamber of Commerce* has been beneficial not only to Yorkshire, but to the whole of the wool manufacturing industries of the United Kingdom. The Chamber was largely instrumental in bringing about the establishment of the Bradford Technical College, the Conditioning House, and the Board of Conciliation. It also compiled a Standard Weavers' Wage List for the worsted industry, and adopted a code of rules for the regulation of yarn contracts—both of which have proved extremely useful. It also drew up certain wool-sorting rules and wool-combing rules; both of these were afterwards adopted by Government, and are now applicable, under the provisions of the Factory Acts, to the whole kingdom. But probably the most important work of the Chamber has been in connection with the development of the supply of combing wools. In 1859 it became evident that the supply of wool suitable for combing was becoming more and more inadequate for the ever-increasing demand. A "Wool Supply Committee" was therefore formed by the Chamber for the purpose of promoting the growth of wool in India and Australia and the Cape. The Committee spent much time and money in sending out long-woolled sheep to India and the Colonies, and in advising colonial breeders as to the best methods of producing the wool. The result is the present large supply of long wools suitable for a great many purposes not only in this country but on the Continent and in America. The Chamber has also taken an active part in promoting the growth and improving the quality of mohair at the Cape. It may be said without exaggeration that the work of the Chamber has been one of the main factors in the building up of the great trade of Bradford and district.

The *Conditioning House*, which, after a long struggle,

the Chamber of Commerce induced the Bradford Corporation to establish, is an institution for the purpose of ascertaining the "condition" (*i.e.* the percentage of moisture, oleaginous matters, etc.) in wool, tops, noils, yarns, and other articles submitted for the purpose. Standards have been laid down for the regulation of these matters, and many thousands of tests are made every year. Tests are also made as to the counts and lengths of yarns, the tensile strength of yarns and woven materials, the component parts of mixed materials, the thickness of fibres, and numerous other matters affecting the trade. The institution was established in 1891, under parliamentary powers. It was for some years the only institution of its kind in this country, but a similar institution has recently been established in Manchester.

The *Board of Conciliation* was established in 1891 to promote methods of amicably settling labour disputes and preventing strikes and lockouts. It consists of six members representing employers, elected by the Chamber of Commerce, and six members representing employees, elected by the Trades and Labour Council. During the first few years of its existence the Board rendered very valuable services to the trade of the district, owing to the number of labour disputes it was the means of settling. It also averted what would have been a disastrous strike or lockout in the dyeing industry, when 6000 operatives would have been thrown out of work. Fortunately, the services of the Board have not been requisitioned in recent years. Several other towns in the West Riding have imitated Bradford in this respect, and have adopted the Bradford rules.

There are numerous other matters into which I should like to enter, but I have already exceeded the limits of my paper.

From what I have said, you will have gathered that the Yorkshire textile industries, especially the worsted industries, are highly specialized; and the tendency appears to be for this specialization to increase, both in regard to the various processes and also to the different kinds of fabrics produced. Up to the middle of the last century it was quite common for a manufacturer to buy several kinds of wool, and to comb, spin, and weave them into several different fabrics; but at the present day not only do worsted manufacturers in many cases confine themselves to the production of one class of goods, but, as I have shown, the combing, spinning, and weaving are mostly undertaken by separate firms, and many of these deal with only one special kind of wool or yarn. In this specialization lies the strength of the industries. It enables a man to concentrate his energies on one particular kind of work and to do it as economically and as perfectly as possible. A manufacturer will tell you that he can buy his yarn from the spinner cheaper and better than he could spin it himself, and a spinner will tell you that it would not pay him to comb his own wool, as he can buy his tops from the top-maker cheaper than he could make them himself. Another advantage is the avoidance of keeping large stocks. The merchanting of the different articles is also to some extent specialized, as I have shown. Very few manufacturers, indeed, merchant their own goods. It is beyond question that the merchanting system, as carried on in Bradford, *i.e.* entirely separate from the manufacturing, has contributed very largely to the prosperity of Bradford, and to making that city the most important wool and wool manufacturing centre in the whole world. The growth of the population of Bradford is shown by the following figures:—

POPULATION OF BRADFORD.

	Population.	Rateable Value. £
1801	13,264	—
1811	16,012	—
1821	26,309	—
1831	43,527	—
1841	66,715	137,778
1851	103,778	201,717
1861	106,218	290,918
1871	145,827	541,532
1881	194,491	927,238
1891	216,361	1,025,106
1901	279,767	1,421,200
1902	281,770	1,462,746

As regards the present position of the woollen and worsted industries, it cannot be said that those industries are in a bad way. It is true that thirty years ago, *i.e.* in 1872, our exports of woollen and worsted yarns, pieces, etc., were valued at £40 millions, whilst last year they amounted to only £25 millions; but in considering this diminished value, we must take into consideration the fall in the prices of the raw material. Thirty years ago the prices of Lincoln half hoggs (the standard for English wool) was 24½*d.*; to-day it is only 6½*d.* Mohair then was 3*s.* 6*d.*; to-day it is only 1*s.* 4*d.* If our exports of piece goods, yarns, etc., were valued at the prices of thirty years ago, instead of being only £25 millions they would be considerably over £40 millions. Thirty years ago we used up in the United Kingdom, and mostly in Yorkshire, 320 million lbs. of wool, mohair, etc. (excluding shoddy). Last year we consumed 500 million lbs. Yet the value of the last year's large quantity was only £15 millions, whilst the much smaller quantity of thirty years ago was worth about £20 millions. We are undoubtedly using a very much larger quantity of raw material; and this, taken in conjunction with our stationary exports, clearly shows that we are turning out

larger quantities of tops, yarns, and pieces, and consequently that we are gradually but surely increasing our hold on the home market, notwithstanding the fact that we afford an open market to our foreign competitors, whilst they try to close their markets against us by the imposition of excessively high import duties.

During the last few years we have been lectured without stint by our Consuls abroad as to our obsolete and defective business methods, and we have been told in high quarters that if we are to maintain our place in the world's trade we must "wake up." These remonstrances may be applicable to some manufacturing places in this country. I don't suppose they apply to Birmingham, and I can say with certainty that they do not apply to the West Riding, at any rate not to the Bradford district. The very existence of the Yorkshire manufacturers and merchants depends upon their keeping abreast with the times. No industry in the world has been subjected to so many changes or suffered so much from the vagaries of fashion as has the worsted industry, and no other industry has shown more readiness to throw out obsolete machinery and install new plant in order to meet the ever-changing requirements of the day; and so long as Yorkshire manufacturers, dyers, and merchants maintain their present enterprise, inventiveness, and vigour, they have nothing to fear from foreign competition.

THE BRITISH FLAX AND LINEN INDUSTRY

WITH SPECIAL REFERENCE TO ITS POSITION IN IRELAND

Sir R. Lloyd Patterson

I APPRECIATE the compliment implied in the request that I should repeat before the Faculty of Commerce in this University, with some additions, the paper on the Linen Industry which I had the honour to read before Section F of the British Association at its recent meeting in Belfast.

A carefully prepared and reliable article on the subject appeared in the *Statist* of 28th October, 1899; and it was there mentioned that the capital engaged in the business in Ireland alone is estimated at about £12,000,000, and the annual wages fund distributed to those directly employed in it to about £3,000,000, besides the wages earned in various other industries more or less dependent upon the staple.

It will be thus seen that the subject is a large one. The limited time at one's disposal at a meeting like the present admits of little more than a sketchy outline of it, a finished picture being out of the question.

Linen is probably the oldest known textile. The mentions of it in Holy Writ are numerous; and the evidence furnished by the mummy cloths of Egypt

proves that its manufacture was an important industry, and one that had been brought to great perfection in that country, at least fifteen to twenty centuries before the Christian era.

It is supposed that linen was first introduced into Ireland by those old-world navigators and merchants, the Phœnicians; and, the soil and climate being eminently suitable for the culture of flax, it soon, in a double sense, took root there. Much of what occurred in those early days is lost in the mazes of time, and such knowledge as may have come down to us is more traditional than historical. It is on record, however, that when the Danes took Bangor, County Down, and despoiled the monastery there in the ninth and tenth centuries, and, later, at the sacking of Armagh by the English towards the end of the twelfth century, part of the spoils of the victors at both places consisted of "much fine linen," of which material the robes and vestments of the higher clergy were then composed; and at which period also the custom of wrapping the bodies of the dead in linen had already come into vogue in Ireland. This country may also have been an early exporter of linen; as it is recorded that at a robbery which took place at Winchester in 1272 among the articles stolen was some "cloth of Ireland," presumably linen.

There seems no reason to doubt that the manufacture of linen continued uninterruptedly in Ireland up to the year 1699; when, after the revocation of the Edict of Nantes, a French Huguenot refugee named Louis Crommelin, following some and accompanied by others of his countrymen, settled in the neighbourhood of Lisburn; and the Irish linen industry, as it has come down to us, may be considered to date from that period and event.

Crommelin, having been acquainted with the processes of the growth, preparation, and manufacture of

flax, as then carried on in France and Flanders, greatly improved the methods previously prevailing in the North of Ireland, and the industry was a great gainer by his example and precept. The English Government, whose selfish policy had strangled the rising woollen ndustry of Ireland in the interests of the English manufacturers, recognized, early in the eighteenth century, the then growing importance of the linen trade in and to the country by the establishment, in 1711, of the "Board of Trustees of the Linen and Hempen Manufactures of Ireland," to encourage, protect, and extend the business. The custom of wearing linen scarfs and hat-bands at funerals originated about the same time, the then Lord Lieutenant (the Duke of Ormond) having ordered their use to increase the demand for the article. The Board of Trustees just mentioned, called for the sake of brevity the "Linen Board," had its headquarters in Dublin, and was composed of an equal number of prominent noblemen and gentlemen chosen from each of the four provinces. It had a parliamentary grant of £20,000 a year, which it seems to have disbursed, with of course some exceptions and jobbery, on the whole with discretion and with advantage to the recipients and to the trade at large. The operations of the Linen Board continued down to the year 1827, when the Government of the day decided that the industry no longer required the extraneous assistance of the grant; and the Board, after an existence of one hundred and sixteen years, was dissolved.

Although interesting, it is now unnecessary to trace the history of the trade throughout the remainder of the eighteenth and earlier part of the nineteenth centuries. During that period all the yarn used was spun by hand and was woven by manual labour, both operations being

principally pursued by the peasantry in their own houses, the women spinning and the men working at the looms.

The brown linens so produced were all sold in country market towns, the bleachers and merchants riding on horseback from market to market to buy them, and riding in company for mutual protection; as, owing to the absence of banking facilities, they had to carry their money along with them.

Early in the history of the industry it would seem that the production of certain makes of goods got located in certain districts, so that a buyer knew exactly where to go to find what he wanted for his special trade. Ballymena, for instance, was the centre and market town of an important section of the trade in the manufacture of fine, yard-wide linens, used for shirtings, and especially for the cuffs, collars, and fronts of shirts. Lurgan was the centre of the lawn and cambric trade, besides dividing the damask and diaper business with Lisburn and Dromore. Banbridge and district had a monopoly of the manufacture of heavy and medium linens and sheetings; while another district of the County Down produced a class of light medium goods rather heavier than those for which Ballymena was famous; and other places had other specialities, most of them very distinctly localized. Dublin was long the headquarters of the white linen trade of Ireland, and had its White Linen Hall, to which English buyers resorted to supply their wants; but, by-and-bye, in 1783, Belfast got its own White Linen Hall, which has only lately disappeared to make room for the new Town Hall, now in course of erection.

The evolution of the Irish linen industry, as it exists to-day, from the more primitive methods just mentioned is due to three principal causes, namely :—

an important bearing on the earlier history of flax spinning, as the skilled operatives that were losing their employment in the former found it again in the latter—an immense advantage to employers as well as employed. To have had to train all the skilled labour required out of completely untrained material would have been a tedious and serious matter.

The 500,000 spindles of 1853 showed a nett increase at the end of the century of about 338,000, the total being then estimated at 838,582, a moderate increase on balance for a period of forty-seven years; but some noteworthy fluctuations had occurred in the meantime.

The size of the mills in former times as compared with the present is worthy of remark.

It has been mentioned that in 1853 there were 80 spinning mills, containing 500,000 spindles, in the north of Ireland; while now 51 firms or companies own 838,582 spindles (contained in 58 mills). That is, while say fifty years ago each separate spinner in the trade had an average of 6250 spindles, each company or firm now controls an average of 16,442 spindles.

While on the subject of the number of spindles in the country at different times, I wish to express my acknowledgments regarding this and other matters to the interesting and valuable reports of the Flax Supply Association. From these I learn that the number crept up from the 500,000 spindles of 1853, till 1875—ten years after the close of the American War—when the maximum of 924,817 spindles was reached. Thenceforward till now the tendency has been generally, but only slightly, downwards, some little upward movement or a standstill for a year or two being occasionally recorded; the total nett decline during the last twenty-five to twenty-seven years is only 86,235 spindles.

The reports referred to record the number of mills

dismantled from 1876 to 1900 as 15, and of spindles stopped during the same period as 160,497. Speaking from memory, but going further back than the period mentioned, I can recall about 40 mills silenced in Ireland within about forty-five years. This number includes mills at Derry, Coleraine, Larne, Lurgan, Dublin (three), Limerick, Drogheda, Carrick-on-Suir, and many other places where there is now *no* spinning; besides Carrickfergus and Cork, in each of which one mill continues working successfully. Most of the mills silenced were small country concerns, some of which had had but a very short life; but others were old-established concerns, and among these again some were large and important. The year 1902 witnessed the shutting down of one mill of about 15,000 spindles in Belfast; and 1903 the breaking up of another of about 10,500 spindles. The latter was bought by the Flax Spinners' Association for the express purpose of having it broken up; and was resold by them (at a loss) coupled with a stipulation that it was to be so treated. This policy of silencing spindles has been pursued on prior occasions by the Association named. Its wisdom is questionable; and in my opinion is barely defensible, even on the grounds of expediency alone.

In the last thirty to thirty-five years or so many concerns, I could name twenty or more, have been stopped or broken up in Scotland; while a similar fate has overtaken very many in England, the once important flax-spinning industry of Yorkshire being now almost extinct. I can recall twelve to fifteen flax-spinning mills in Yorkshire, some of them very large concerns, one at Newcastle-on-Tyne, and one at Shrewsbury, none of which are now working. Of several formerly in Cumberland, only two or three (so far as I know) survive, while of some seven or eight mills that I remember

in Lancashire I believe now only one—an important concern in Manchester—continues working.

The linen-weaving industry of Yorkshire, on the other hand, now supplied principally by foreign yarns, has maintained its position well.

In the west of England, Somersetshire and Dorsetshire, a rather important, but latterly non-progressive, flax industry has long been located. It is principally concerned in the production of twines for net-making, nets, fishing-lines, and sail canvas.

Owing to certain local advantages Irish spinners have hitherto had the best of it in this struggle for existence; for, with the over-production that was going on, it had become a question of the survival of the fittest.

Let us now compare the figures for Ireland with similar returns from the principal flax-spinning countries in continental Europe, viz.—

In GERMANY and AUSTRIA the maximum was reached in 1874 with	741,214	spindles.
While in the last returns to which I have had access this number was reduced to	573,210	,,
A diminution in twenty-seven years of	168,004	,,
In BELGIUM the maximum of ... ... was reached also in 1874.	320,000	,,
By 1900 the number had fallen to	287,580	,,
A diminution of	32,420	,,
In FRANCE the maximum of ... ... was reached earlier, in 1867.	750,000	,,
The year 1874, which was the highest in the other continental countries mentioned, already showed a considerable decline in France. This went on continuously till now (1902), when the number has fallen to	448,426	,,
A diminution of	301,574	,,

We thus see that, while Ireland showed a decrease in about twenty-five years of 86,000 odd spindles, Austria and Germany had decreased by 168,004, Belgium had decreased by 32,420, and France, over a rather longer period, had decreased by 301,574. That is a decrease in those countries of 501,998 spindles.

This is a significant commentary on what we so often hear about continental competition killing the Irish trade; for, while the Irish spindles have decreased about 9 per cent., those in the continental countries named have decreased in about the same time some 27½ per cent., and those in France alone about 40 per cent.

Italy has now some 65,000 spindles at work; and in Russia, fostered by high tariffs, the industry is assuming important dimensions, the 83,000 spindles of thirty years ago having increased to over 300,000. Russia now, instead of importing from us, exports yarns to both Scotland and Ireland, to the detriment of the spinners in both countries.

Measured as near as may be by decennial periods, the number of spindles in Ireland is given in the Report already mentioned as follows:—

In 1828	wet spinning of flax by machinery commenced.			
„ 1841	there were returned	250,000	spindles.	
„ 1850	„	„	326,008	„
„ 1861	„	„	592,981	„
„ 1871	„	„	866,482	„
„ 1875	the maximum of		924,817	„ was reached.
„ 1881	there were returned		879,242	„
„ 1891	„	„	827,451	„
„ 1901	„	„	834,146	„

During the decade between 1850 and 1860 there were some disturbing causes. The outbreak of the war with Russia had at first an adverse effect on the trade, owing to the interruption in the supplies of flax from that country; but by 1860 trade had resumed its normal

conditions. The increase in spindles in the period was large. The American War broke out in 1861. Its effects at first were gravely adverse, the United States being our largest customers; but when cotton ran up in price from about *6d.* to about *2s. 6d.* per lb., linen became the only substitute for the almost unobtainable cotton goods; and this gave the linen industry such a stimulus that from 1861 to 1868 the number of spindles in Ireland had risen from 592,981 to 894,272, an increase in seven years of 301,292 spindles, or rather over 50 per cent. The outbreak of the Franco-German War in 1870 temporarily upset the trade after its condition had again become normal; but this did not last long, and the restoration of peace ushered in a period of great prosperity, till in 1875, as already mentioned, the maximum number of spindles was reached. From 1880 till 1890 business was steady and on the whole fair; but soon after the latter year a period of depression set in which, with some few brief prosperous intervals, has practically lasted ever since, and is seriously felt just at present.

To the continued, steady prosperity of any industry an adequate and constant supply of the raw material consumed in it is a matter of primary importance. Owing to the general suitability of the soil and climate of Ireland for the growth of flax, and the large consumption of the fibre in the country, one might suppose that home wants would, for the most part, be met by home produce; but such, unfortunately, is not the case —all the coarser and also all the finer material required being imported, the former from Russia and the latter from Belgium—Ireland supplying only a portion, latterly only a very small portion, of her own requirements in the medium qualities.

The extent of the land under the flax crop in Ireland has fluctuated enormously within the last fifty years. In 1860, the year before the outbreak of the American War, the sowing amounted to 128,595 statute acres. This figure showed a large yearly increase till 1864, when the maximum of 301,693 acres was reached. It has been estimated that that acreage yielded 34·43 stones per acre, or a total of 64,506 tons, which at the average price of £58 4*s.* 3*d.* per ton, should have produced a sum of say £3,754,250. Discouraged by that (then) comparatively low price, £8 per ton less than the year before, the following year showed a decrease of 50,260 acres in acreage, which, coupled with a diminished yield (of only 25·14 stones per acre, or a total crop of 39,561 tons) and continued brisk demand, raised the average price of Irish flax to £81 9*s.* 0*d.* per ton, an advance in one year of over £23 per ton, or fully 40 per cent., which, with one exception, 1868, when the maximum average of £82 12*s.* 0*d.* was reached, is the highest on record. The following year, 1869, saw a return to normal conditions with an average price of £58 11*s.* 10*d.*, a fall of £24 per ton. Thenceforward it will suffice to mention the Irish flax sowing in decennial periods, till we come to the last seven years.

		Acreage: Statute Acres.	Yield in Stones per Acre.	Total Yields in Tons.	Average Price per Ton.
Thus in	1870 there were	194,893	25·71	30,771	£54 17 6
,,	1880 ,,	157,534	24·89	24,508	55 17 4
,,	1890 ,,	96,871	33·10	20,045	50 14 1
,,	1895 ,,	95,202	21·80	12,972	43 16 8
,,	1896 ,,	72,253	24·02	10,844	39 16 10
,,	1897 ,,	45,576	23·93	6,818	42 13 9
,,	1898 ,,	34,489	29·14	6,281	46 11 9
,,	1899 ,,	34,989	30·83	6,743	52 4 8
,,	1900 ,,	47,451	31·96	9,479	60 2 9
,,	1901 ,,	55,442	36·93	12,797	52 6 0
,,	1902 ,,	49,746			
Maximum	1864 ,,	301,693	34·43	64,506	£58 4 3

These figures and those immediately preceding are very interesting and very instructive. They show that the lowest average price on record was touched in 1896; and the result is immediately reflected in a decrease of 26,677 acres in the sowing of the next year, 1897, when, most unfortunately, the evil of a poor yield was superadded to that of a wretched price. No wonder the long-suffering Irish farmer was discouraged; and we find in the two following years the smallest sowing on record, both under 35,000 acres, with yields in both cases of under 7000 tons.

Over the last forty years the average price paid by myself and my successors in business for over 20,000 tons of Irish flax of a great variety of qualities was £58 per ton. This compares with a maximum average of £82 12*s.* 0*d.* in 1868 and a minimum average of £39 16*s.* 10*d.* in 1896, a difference between the maximum and the minimum of nearly £43 per ton. The highest price ever paid by myself for Irish flax was £128 per ton.

In those critical years ending the last century the Irish spinner found himself in a dilemma. Trade was bad; flax prices fell very low, and Russian flax could be had at exceptionally low rates. A standard mark known as Pernau D, which was sold in the "booming sixties" as high as £70 per ton, and for which £40 was long considered the minimum price, was repeatedly dealt in in quantity, in the years 1897 to 1899, at from £20 to £22 per ton. By 1900 it had risen to £34. Self-preservation compelled Irish spinners to buy that cheap material. Thus, although the thinking ones among them felt that such starvation prices as £40 to £42 which prevailed in Ireland in 1896 and 1897—quantities of coarse flax changing hands at far below these average figures—would inevitably lead to

diminished sowings, to their own ultimate detriment, they were powerless to prevent it.

Every one would welcome increased sowings of flax in Ireland. It may have been noticed that 1900 and 1901 showed some reaction from the extreme depression of the two previous years—no doubt partly under the stimulus of rising prices ; but for various reasons, among them the increasing scarcity of labour in the country, I have no hope of the figures of former sowings being ever seen again. Following the fall of £8 per ton in 1901, the sowing of 1902 shows a decrease of nearly 6000 acres. Some Irish flax is exported every year, as there are some purposes for which it is the most suitable fibre in the world ; and in the big sowings in the sixties and seventies the quantity exported to England, Scotland, France, and America was large.

The quantity of home-grown material left after deducting the exports must be supplemented each year by importing foreign supplies to make up the total quantity required for consumption. The imports of flax into Ireland for the last ten years average 33,000 tons per annum. Under more favourable conditions most of the large sum of money required to pay for this might be kept in the country.

The American War has already been mentioned, but must be further alluded to as having had an influence on the whole subsequent history of the linen trade that no one could then have anticipated. During the inflation in it caused by the extreme scarcity and famine prices of cotton some rapid fortunes were made ; and there was a strong desire on the part of many to participate in so lucrative a business. That period therefore witnessed large extensions to many existing concerns, and the erection and equipment of many new

ones, some of which had but a brief existence. But it also witnessed a willingness on the part of many proprietors to sell their concerns, the buyers being in most cases limited liability companies formed for the purpose. Comparatively few of the concerns that thus changed hands at that time have proved satisfactory investments for their new shareholders; and in the majority of cases—with some few notable exceptions—many of them have become, and seem likely to continue, non-dividend paying. Some have gone into liquidation, while others have been re-constructed or have readjusted their capital accounts. The continued existence of some of these concerns, which would have been impossible were it not for the tenacity of life imparted to them by the elasticity of credit attaching to the limited liability system, is detrimental to their better-off competitors, the impecunious producers breaking prices, which lead others are then virtually obliged to follow, and the trade is thus deprived of a fair return on the capital invested in it. In fact, credits are too long, and generally too lax also, for the permanent good of the trade.

It was anticipated by some that the increase in machinery which took place during the period of inflation, might leave the industry saddled with an over-production when the trade of the world should have resumed normal conditions; but it was argued, on the other hand, that the linen trade had got a tremendous "fillip," part of the effects of which it was hoped would be permanent; beside which it was not unreasonable to assume that the ordinary growth in the use of an article like linen, which, in its various fabrics, had for ages been regarded as one of the first necessity for domestic purposes, personal wear and table use, would soon overtake any surplus production.

Such expectations, however, were doomed to disappointment; and for various reasons, some plain enough, others obscure, the linen trade of the world has not been expansive; of recent years, indeed, decidedly the reverse; but in Ireland the trade, as compared with other countries, is more than holding its own.

The great competitors of linen are cotton and wool, especially cotton. Wool only competes as clothing: the lighter fabrics, that are now produced in it for all kinds of wear, commend themselves to many on account of the saving of expense and trouble in frequent washings. Cotton is a much more serious competitor. Its cheapness, its superficial resemblance to linen which the superior finish now applied to it has increased, and the much greater variety, especially in colour, in which it is produced, are all so much to its advantage, that, while we regret, we need not be surprised at the larger share of public favour which it receives.

Changes of fashion too are partly responsible for the diminished consumption of some kinds of linen fabrics. In my younger days no one calling himself a gentleman wore (in the north of Ireland at least) anything but linen shirts: now but few do so. Then linen ducks and drills were frequently worn as summer trouserings: one never sees them now. Then no ladies used anything but (linen) cambric handkerchiefs: now cotton handkerchiefs, plain and printed, are sold in enormous quantities both at home and abroad. Some important firms in Belfast, who were formerly doing business in linen and cambric handkerchiefs only, have turned their attention, in part or in some cases even entirely, to cotton. The diminution, almost cessation, of the use of linen scarfs and hat-bands at funerals must account for a serious total.

It has often struck me as strange the large profits

that retail drapers charge on linens of all descriptions as compared with cottons. Such a practice must have a deterrent effect on the general use of linens; but there is no moral turpitude in it such as there was in those frauds, so properly exposed a few years ago in the prosecutions brought by the Linen Merchants' Association against certain people for selling union, and even all-cotton goods, as "pure linen." I am afraid, from the disclosures at that trial, that such frauds are only too common. The public are cheated; and the trade suffers from the disappointment caused by the unserviceable character of the so-called linen.

To protect the public from fraud it has been suggested that there should be some mark of identification on linen as there is now on plate, and I don't see why there should not be such. A fine damask table-cloth, for instance, is much more valuable than a few silver spoons.

One sometimes hears the complaint from old housekeepers that linen is not so durable as it used to be. That may be so, but only to a limited extent. Goods must now be bleached farther to meet the inexorable public demand for pure white linen; but the *real* ground of the complaint is to be found in the abuse which linen now receives at most modern laundries, and the too free use of chemicals in these establishments.

One new outlet for linen yarn which promises well has lately been found through the ingenuity of a gentleman resident in Denmark. He was a manufacturer of woollen hosiery. He was a sufferer from rheumatism, which led him to consult an eminent physician, who advised him to substitute linen for the woollen underwear he had previously used. He, being a woollen manufacturer, not unnaturally demurred; but he commenced and finally worked out the problem of adapting

something in the nature of a stocking loom or knitting machine to the peculiarities of linen yarn ; and the result is the production of a new and extremely comfortable material for underwear, which is already most favourably reported on by the medical journals and by many leading medical men in England and elsewhere. Something of this kind ought, in creating a new outlet for linen yarn, to help the spinning interest materially. This new material is known in the trade as Kneipp linen mesh underwear.

A firm at Portadown is also now producing some very attractive novelties in plain and fancy linen mesh, some bleached and dyed specimens of which I have seen and been greatly pleased with.

I may here, with advantage, refer to a manuscript left by the late Mr. Robert MacAdam, of Belfast, in which it is stated that about 1836, Irish yarns and linen were being sold in considerable quantities to France. The business was of sufficient volume to encourage a shipping agent to despatch a vessel direct to a French port, and in December, 1836, the first cargo of Belfast yarns and linens sailed for Dunkirk. The project was successful ; and it was followed up, so that in 1839 a steamer commenced plying regularly, once a fortnight, from Belfast to Havre, carrying yarns and linens ; while there were also sailings to Antwerp, Dunkirk, and Nantes. It will thus be seen that long prior to the outbreak of the American War the various linen manufacturing countries in continental Europe had been large buyers of our yarns, and some of them good customers for our linens also.

The enterprise of the linen magnates at Lille, Ghent, and Bielefeld, and in Silesia and Bohemia, did not lag long behind that of our own spinners, and mills sprang up in many places. While business was very brisk, these

	80's line weft.	25's tow weft.
December, 1860—Before the American War ...	4/3	6/3
August, 1864—Height of do. do. ...	6/7½	10/4½
December, 1865—After its close	6/1½	8/-
December, 1868	5/3	6/10½
September, 1870—Franco-Prussian War ...	3/4½	5/9
December, 1870	3/6	5/9
,, 1871—War over	5/1½	6/9
,, 1875	4/6	6/9
,, 1880	4/-	5/6
,, 1885	3/4½	5/1½
,, 1890	3/7½	4/5½
,, 1894	2/10½	4/4½
,, 1895 A period of great depression ...	3/-	4/9
,, 1897	2/10½	4/3
,, 1900	4/-	5/3
Maximum, August, 1864	6/7½	10/4½
Minimum, 1894 and 1897	2/10½	4/3
Extreme fall from maximum to minimum ...	3/9	6/1½
	or 57 per cent.	and 59 per cent.

The above figures show the extremes of the inflation of the American War time and the depression of some of the years in the last decade—1890 to 1900—when it is not too much to say that the trade came through a most severe crisis, resulting in disaster to some; but from which the industry on the whole emerged very well.

Let us now glance at the next process in the linen industry—weaving. We have seen how that was formerly all done by manual labour. The power-loom had long since come to be of general application in the cotton trade in England; and many and earnest were the efforts to apply it to linen. But serious difficulties were encountered, and had to be overcome before the weaving of linen yarn by power became a practical and commercial success. The want of elasticity of flax yarn, notwithstanding its greater strength as compared with cotton, had long barred the way of the power-loom,

which had not the consideration, so to speak, the give and take of the hand-loom weaver, for the rigidity of the linen warps. Improved mechanical arrangements in the looms, and the application of a newly discovered superior dressing for the warps, which had the effect of making them softer and more elastic without impairing their strength, finally prevailed; and the power-loom came to stay, as a permanent and most important factor in the Irish linen industry, some time in the early fifties. The report already quoted from states that in 1850 there were 88 linen power-looms in Ireland. At the end of 1899 there were 32,245. The pioneers of the industry were Mr. Craig and Mr. Currell, each with 40 looms, in 1847.

My own recollection of power-loom linen weaving does not extend beyond the year 1855, by which time it was established on a moderate scale but on a firm and successful commercial basis, with evidently a great future before it.

The first return in the report after 1850 is for the year 1856, and the number of looms is given at that time as 1871. Since that period the progress has been steadily and quite uninterruptedly upwards.

In three years, by 1859, the number of power-looms had about doubled to 3633. After the end of the American War the number of looms, which, before its outbreak, had stood at 4933, had increased in 1866 to 10,804. The increases since have been rapid and constant.

In 1871 the number is returned at			14,834
,, 1881	,,	,,	,, 21,779
,, 1890	,,	,,	,, 26,592
,, 1899	,,	,,	,, 32,245

Of these looms a considerable, but unascertained, number are employed on union goods.

During this period hand-loom weaving has, unfortunately, as steadily declined, and is now reduced to very small dimensions, confined to the manufacture of the finer descriptions of different classes of goods.

The quantities and values of linen exports from the United Kingdom can be found by those wanting such information in detail in the returns of the Board of Trade. For our present purpose it may suffice if I quote the total declared values of the exports of linen manufactures of all kinds, including threads, for the following years :—

1850	£3,947,682
1860—The year before the American War ...	4,804,803
1861—The year it broke out	3,852,341
1865—When it was at its height	9,156,990
1870—A normal state of affairs	7,248,345
1880 ,, ,, ...	5,836,019
1890 ,, ,, ...	5,710,168
1900 ,, ,, ...	5,224,594
1901 ,, ,, ...	5,020,499
1902 ,, ,, ...	5,427,969

The last thirty years thus show a gradual decline, except in 1902. The above figures include British as well as Irish manufactures; but they do not show the value of the Irish goods consumed in the United Kingdom, which would reach a very considerable total. I must also point out that the figures just quoted deal with values only; if quantities were also considered the decline in the volume of trade would not be nearly as great as values, considered alone, would indicate, prices being now on a low level.

The manufacture of linen threads has long been an important branch of the flax industry of Ireland, giving employment to a large number of operatives in several extensive concerns.

The export branch of the thread business, however, is by no means what it was. High tariffs in the United

States put an end to that; the result being that the principal makers of linen thread in the three kingdoms have established their own thread works in the States, importing their flax hackled, that is dressed ready for use, from the parent works in these countries.

Bleaching has always been an important part of the linen industry of Ulster; and, owing to the admitted superiority of the Irish bleach, a considerable quantity of linen is sent from Belgium, France, and Germany to be bleached here, and returned to those countries for sale. This excellence is doubtless due to our humid, temperate climate. Owing to the nature of the business bleach-greens were first established, and must perforce remain, in country districts.

During the last forty odd years many bleach-greens have ceased working; but during that time others have been enlarged; and, as the process is now quicker than formerly, the total output from the greens continues large. Some twenty bleach-greens now suffice for the trade of Ireland, while Mr. MacAdam enumerates 65 at work in the year 1839. The length of time required for bleaching varies with the nature and weight of the fabric, from about three to eight weeks. All fine linens are still spread on the grass during the bleaching process, to improve the colour and to completely purge them from any trace of the chemicals used in an earlier stage of the work. The substitution of vitriol as an acid instead of the sour buttermilk formerly used, and other equally drastic changes have become matters of ancient history; while a completely new system is now on its trial.

The operatives engaged directly in the industry are numerous, estimated at over 70,000 of both sexes, and

of all ages, from half-timers upwards, in the mills and factories alone; while it is estimated that from 25,000 to 30,000 more find employment in bleaching works, embroidery, making up, and in the lapping-rooms and warehouses. Besides these, there is a further large number for whom it provides indirect employment, in connection with flax growing and scutching, the coal trade, the foundries and machine-shops, and in many other ways.

We have seen how, as the spindles gradually and moderately diminished in number, the power-looms rapidly and largely increased. There was thus at no time within recent years any lack of employment; on the contrary, a scarcity of workers is often felt, especially in some places near Belfast, in which the working population seems always more or less unsettled, but inclined to drift to the larger centre. In more remote country places the workers, drawn from the agricultural population of their respective districts, have more of the home instinct among them, and are less unsettled than those nearer town.

The "making up" trade, as it is called, and the hemstitching, embroidering and finishing of handkerchiefs, are comparatively recent branches of the industry, which employ a large number of hands, and are liked as being cleaner and pleasanter and less fatiguing work than spinning, at which the worker has to stand all day.

The shipyards and foundries employ exclusively male labour, while in the mills, factories, and warehouses, female labour largely preponderates, the two, no doubt, mutually helping each other, and increasing the numbers of bread-earners in many families where there are young people—the boys going to the foundries, shipyards, and other work of the kind, and the girls to

the factories. In my opinion, however, rather too much stress has been laid on this, as the better class of craftsmen consider their girls too good for mill or factory work.

The wages earned in the different departments seem fair as compared with those in other trades and at other places; and, owing to facility of communication, town and country now show no material difference. The rate of wages received by females engaged in the industry is about the same as paid to the same classes in France and Belgium, and higher than is paid in Germany and Austria; while that paid to men is considerably higher than on any part of the Continent.

In some concerns a system of bonus for good attendance or extra work done prevails, and is found advantageous to both employers and employed.

The operatives in the various industries of Belfast are fortunate in the place having long been the seat of an important building trade, to meet the rapid growth of the city, the result being the erection of a large number of comfortable houses of various sizes to suit all requirements, from those of the day labourer to the skilled artisan. On the whole, except where the curse of drunkenness comes in, the linen operatives of Belfast are as well housed as are the same classes in any similar city in the kingdom; while the number of houses erected keeps the rents moderate.

In some processes in the spinning mills there is much dust, and in others much moisture, the latter inseparable from wet spinning; but these evils are mitigated of late by improved ventilation, brought about by the use of fans for the expulsion of the foul and introduction of fresh air, so that the health of the workers is materially improved, and the mortality among them is not above the general average of the entire population.

Approaching conclusion, let me say that part of what is wanted to bring about an improvement in the long-suffering linen trade is greater variety of fabric, to the production of which the ingenuity and taste of our manufacturers might well be applied. Two new fabrics have already been mentioned—the linen mesh manufactured at Portadown, which seems adaptable to many everyday requirements in clothing; and the so-called Kneipp linen mesh, manufactured in Denmark from pure flax yarns spun in Ireland.

The knitted Kneipp linen mesh is, from the very nature of the way in which it is made, I mean from the one continuous thread with its constant succession of innumerable bends and loops, as compared with the warp threads stretched to their utmost tension, comparatively elastic, more so than any fabric of flax hitherto produced.

If the partial proscription under which linen has suffered of late were removed, and this Kneipp mesh were taken up by the public to the extent its merits seem to deserve, a new chapter in the linen industry, not only of Ireland, but of Europe, and indeed of the whole world, will have been opened. It seems to be a preservative against, and a specific remedy for rheumatism; and I have lately heard of European residents in India and other hot climates finding the use of the linen mesh a complete protection against that distressing tropical complaint known as prickly heat, for its wear produces no irritation of the skin.

New and beautiful designs in damasks charm and delight the eye. Our damask manufacturers are fully alive to the importance of continually putting some new design before the public, while a leading damask manufacturer lately told me that some quite old designs are again coming into vogue, like Chippendale or other old

furniture. The damask department of the trade thus keeps flourishing.

No more serviceable or suitable material for summer dresses for ladies and costumes for children exists than unbleached linen, in its various shades, according to the kind of yarn it is made from and other circumstances; but I believe there is plenty of room for more variety in fabrics, and I trust that the ingenuity of our manufacturers, if applied to the problem, will prove equal to their production.

Although the foregoing paper shows that the Irish flax spinning industry, and, following it, the linen industry in Ireland generally, have more than maintained their relative positions in competition with other countries, even this qualified measure of success has been achieved in the face of great difficulties.

The hours of labour in factories in the United Kingdom are limited by statute to 55½ per week; whilst in France, Belgium, Germany, and Austria the hours, as I am informed, are 66 per week. I understand France intends to come down, in two steps of three hours each in 1903 and 1904, to 60 hours per week.

Until May 1, 1902, the hours of labour in Great Britain and Ireland were 56½ per week; but in the session of 1901 Parliament decreed that the hours should be curtailed by one. This piece of legislation, enacted without adequate assigned reasons, reduced the output of mills by 2 per cent., and still further handicapped the industry in its competition with foreign countries. As the cost of flax-spinning plant is extremely heavy, any reduction of the output is a serious factor in increasing the cost of production.

Another difficulty with which the trade has been

confronted is the serious rise in foreign tariffs on yarns and linens, which has taken place since 1870. The Customs duties of the United States of America, of France, and of Germany, the three most important customers for Irish yarns and linens, have been increased by about 50 per cent.; while Russia has imposed duties so high as to be prohibitive to the lower and medium grades which come into competition with similar articles manufactured in that country. During the same period the Cuban market, which was a very important one, has been almost lost owing to the recent war and the long previously prevailing unsettled state of the island.

But, not discouraged, Irish spinners have continued to exert themselves so strenuously that their business has probably been as well maintained as that of any other textile industry. They have so improved the methods of treating the flax that from an inferior fibre they can now produce a better spun yarn than formerly, and they have economized processes by supplying the yarn to the weaver in the form in which it can be manipulated with considerable saving of labour. The latest development in invention is an exceedingly ingenious mechanism which, applied to a hackling machine, acts automatically, and enables one boy working at his ease to perform the work previously done by four boys working at high pressure, while at the same time the efficiency of the machine itself is materially increased.

It will, I think, be admitted, that under the circumstances Irish flax spinners have given evidence of courage, energy, and skill. But the results are still more striking when we regard the volume of the trade as a whole. Power-looms have increased to 32,245, which are partially fed with yarns spun on the Continent.

There is reason to believe that the exports of finished linens from Ireland were never at any period higher than of late years. It is, however, impossible to prove this by statistics, as the Board of Trade returns do not separate Irish from English and Scotch exports, nor do they supply information as to the exports from Ireland to England. But I believe that when we take into account the great reduction of spindles in England and Scotland, the small reduction in Ireland, the great increase in looms and the large consumption of foreign yarns, I am justified in the conclusion just stated.

The recently established Department of Agriculture and Technical Instruction is devoting some attention to the improvement of the culture of flax in Ireland. Some satisfactory results have already been obtained, and it is hoped that still better results will be evident in the near future. In no direction can the Department exert its influence with more advantage to the agricultural and industrial interests of Ireland.

The linen industry occupies a different position in Ireland from that which it holds in any other country. For whilst in England, Scotland, France, Germany, and Belgium it is unimportant compared with the other textile, mining, and metal industries, in Ireland it is the only textile industry of any magnitude, and, apart from agriculture, shares with ship-building and engineering in Belfast the rank of being one of the only two important manufacturing industries in Ireland.

BRITISH RAILWAYS AS BUSINESS ENTERPRISES

Charles H. Grinling

As a stranger amongst you, perhaps you will excuse my beginning this lecture with a personal reference, which will at once explain my standpoint and introduce myself. When some years ago I undertook to write the history of an English railway company, I expected that my chief difficulty would be lack of material. On the contrary, I soon found myself in danger of being overwhelmed with matter of very various kinds and almost unlimited quantity. Facts about the promotion and development of the line; details of its engineering structures, big and little; details of its various kinds of locomotives, their development and the development of the many other forms of mechanical equipment employed; incidents connected with the working of the traffic, and the history of improvements in train operation, etc.; the men who administered the undertaking, their characters and careers, and the influence of their personalities upon the progress of the company; the relations of the concern with other railways and with the public; under all these and many other headings interesting and important matter presented itself; and the problem became most perplexing, how to make a homogeneous and coherent narrative out of a mass of

details which, although all related to the subject of the book, seemed to have little or no mutual affinity from a literary point of view. In this quandary I recalled a remark often made by my father (who was for many years Chief Accountant of the Great Northern Railway Company):—"Other departments of railway administration," he would say, "may appear, and no doubt are, more important to the outside public, but, sooner or later, everything comes through the accountant." There I found the connecting thread upon which to string, like so many beads, the multiform facts of a railway history. With the finance of the undertaking, every operation, however diverse, and every manifestation, however varied in aspect, is directly or indirectly connected. Taking the same cue, I want this afternoon to put before the attention of my audience this point of view: that whatever else the railways of the United Kingdom may be—great engineering works, elaborate pieces of mechanism, potent economic forces, revolutionizers of social and business habits, great employers of labour, indispensable public servants—they are all these, but, first and foremost, they are commercial undertakings, business enterprises, established to earn dividends for those who have supplied the capital to create them.

This is the characteristic feature of the railways of this country, the feature which differentiates them from the railways of a great part of the rest of the world. On the Continent of Europe, and in our own Colonies, the railways are, speaking generally, the property or the child of the State, and the earning of profit on the capital invested is consequently of less importance than the rendering of efficient public service, the fostering of native industries, or the protection of the country in time of war. Even in America, the only part of the

world besides the United Kingdom which owes its railway system to private enterprise, the earning of a dividend for shareholders is usually of secondary importance compared with other ends which those who control the policy of the lines have in view, such as the carrying out of great industrial schemes, in which cheap transportation is an essential factor, the opening up of undeveloped territories, or the aggrandizement of individuals. A great part of the capital invested in American railways, too, has been raised, not by shares but by bonds, and bondholders have no voting power.

In this country, on the contrary, the bulk of the railway capital has been raised by shares, and the ultimate authority rests in the hands of those who hold the stock. In times of prosperity the shareholders are quiescent; but their power is latent, and a falling off of dividend is usually all that is needed to arouse it to activity. Travellers and traders grumble, petition, and threaten, with often little or no effect; but let the shareholders unite to demand a reversal of railway policy, and sooner or later the directors must submit. In short, to make a broad generalization, the railways of the Continent of Europe are dominated by the statesman and the military strategist; the railways of our Colonies by the politician or by the civil servant; the railways of North America by the great capitalist. But the railways of the United Kingdom are dominated by the ordinary individual investor, to whom his half-yearly dividend is the prime, and usually the only, consideration. Hence it follows that railway enterprise in this country must come to a standstill, or be conducted on an entirely new basis, if the companies generally should cease to pay a fair dividend to their shareholders.

Before following this point further, it will be worth while to take a glance at railway history in order to

ascertain why the railways of this country are thus distinguished from those of other parts of the world. It was no mere accident that steam railway traction was invented in the North of England in the third decade of the nineteenth century. For if genius be the father, necessity is the mother of invention; and it was because England had already great industries urgently needing a better system of transport that the steam railway was evolved to supplement, and largely to supersede, the canal, the horse tramway, and the road. So George Stephenson's plans found a ready acceptance; the more so as careful estimates of cost and revenue furnished good grounds for believing that, if suitably located, a railway would pay a good dividend, in addition to being of enormous benefit to the traders *en route*. In the case of almost every one of the pioneer lines, the expectations of the promoters were more than realized. The Stockton and Darlington Railway paid 5 per cent. for the first five years after the line was opened, and this had risen to 9 per cent. when the line was absorbed into the North-Eastern system. The Leicester and Swannington paid over 6 per cent. from the start. The Liverpool and Manchester, the first passenger line, returned 8 per cent. to its shareholders for the very first year. The London and Birmingham, the first trunk line of railway, the inception and successful completion of which was mainly due to the enterprise of the merchants of the city in which I have the honour to lecture to-day, paid 10 and 12 per cent. very early in its history, and in a very few years after the opening of the railway its £100 shares stood at over 100 per cent. premium.

Out of these striking and alluring successes arose the great railway mania of 1844-45. For two years the whole country went railway mad. Everybody who had money to invest—and many who had none—speculated

in railway shares and scrip. Millions were wasted on lines which never had any existence except on paper, whilst the companies who actually constructed railways had their capitals extravagantly inflated by enormously costly Parliamentary contests, by outrageous prices paid to obstinate landowners, and by improvident bargains made to conciliate opponents. Of course, a "slump" immediately followed the "boom," and in those black years, 1847 and 1848, thousands bitterly repented their speculations in "Home Rails." But in a short time the surviving companies began to regain prosperity; and although there have been recurring intervals of exceptional depression, home railway enterprise has never really fallen into serious disfavour with the investing public, whilst in times of prosperity many of the stocks have attained the highest level of "gilt-edged" securities. The issues of the leading companies have, in short, come to be the savings bank of our thrifty classes; for although the average yield all round has never quite reached 5 per cent. during the past half-century, it has never fallen below 3 per cent.; and no industry in the world probably can show a more consistently high record of return.

When one turns to look at the qualities of the men under whose administration these results have been achieved, one is not surprised to find that the most influential have been plain men of business. All through British railway history the engineer, whether civil or mechanical, has had to subordinate himself to the man of affairs. At the time of the "mania" the title of "railway king" was bestowed, not on George Stephenson, the inventor of the railway system, nor on Isambard Brunel, its first scientific exponent, but on George Hudson, a linen-draper of York, the man who first placed our railway development on a successful

commercial basis. Unscrupulous and over-reaching though Hudson was, it was his genius for business which conceived and carried into effect the sound principle of amalgamating local lines into trunk railway systems; and both the Midland and the North-Eastern owe the beginnings of their prosperity to the linen-draper railway king. Equally unequipped with technical training, but with as keen a business instinct, united to sounder judgment and higher character, was Edmund Denison, the "father" of the Great Northern. Said he: "Traffic, like water, will find its own level, it will go by the shortest route." From this he argued that, sound as the principle of amalgamation was, a railway made up of a number of short lines constructed for local purposes could not adequately supply the needs of the longer distance traffic, which demanded the most direct routes possible. Consequently he took the leadership of the scheme for constructing the Great Northern —a direct line between London and the North, the first railway to be planned and carried out for the sake, principally, of the "through" traffic. In laying out the original Midland lines, the Stephensons, for the sake of ease and economy in engineering, had followed generally the valley routes, and had placed some of the most important towns on branches instead of on the main lines. "But," said Denison, "roundabout routes may suit the railway-makers; they certainly won't suit the public." Recognizing that the interests of the public and of the shareholder are in the long run identical, the business men on the railway boards insisted on engineering economies being subordinated to the laying out of the most direct lines possible, and from this policy have resulted such great engineering triumphs as the Midland extension from Settle to Carlisle, the Severn Tunnel, the Forth Bridge, and many others

which might be named. Thus the United Kingdom has secured a system of transportation unrivalled for the facilities it affords for traffic from one great centre of population to another, and from the business centres to the health and holiday resorts. We have not only direct lines between all important places, but in many cases we have the advantages of the rivalry of several direct lines. This is one great benefit which has accrued from our railway system having been worked out by business men on a commercial basis.

But, of course, like everything else human, this method has the defects of its qualities, arising from the fact that the business man, particularly when he is a pioneer, must often act in advance of scientific experiment, and that even his expert advisers are apt to be overweighted by commercial considerations. When some of the business men of Leicester wanted to make the Leicester and Swannington line of a less gauge than the Stockton and Darlington, George Stephenson insisted on uniformity for those lines, and also for the Liverpool and Manchester, and the Canterbury and Whitstable, which were on hand at the same time. "Make them of the same width," said he; "they may be a long way apart now, but, depend upon it, they will meet some day." But George Stephenson himself, who, of course, had no scientific training such as the engineers of the modern school enjoy, allowed expediency to predominate over science when he chose 4 feet 8½ inches as the gauge of the first steam railway, just because the waggons in use at the local collieries were that width between the wheels. Moreover, for all their faith in the future of the railway system, Stephenson and his school had not sufficient foresight to choose the wider "loading guage," which was subsequently adopted on the Continent of Europe and in America. Consequently,

British railways are, by the narrowness of their tunnels, etc., restricted to the use of vehicles 8 feet wide, whereas in America and in France the width allowable is from 9 to 10 feet, with a correspondingly greater latitude as regards height. This is an error—inevitable, perhaps, in a pioneer system—from which our railway companies are now beginning to suffer serious inconvenience, particularly in connection with the building of the very powerful locomotives which are necessary to the greatest economy in railway working at the present day. The latest built of our locomotives practically exhaust the limits of the British loading gauge, and yet they are far behind the biggest American engines in power. Brunel was a much more scientific engineer than Stephenson, and in laying out and working the original Great Western Railway he was far less hampered by purely commercial considerations than were the earlier pioneers of the railway system. Unfortunately, some of Brunel's leading mechanical ideas, such as the importance of a low centre of gravity and of a large diameter of wheel—out of which he evolved his 7-foot gauge—were afterwards proved to be erroneous in practice; and the mistakes of Brunel had subsequently to be corrected by Gooch, who, having regard to the inconveniences of a break of gauge, returned to that originally chosen by George Stephenson. Experience suggests that the running gauge of a railway was not really of the paramount importance which was attributed to it in those early days, whilst the loading gauge, *i.e.* the conditions which limit the width and height of the vehicles, has proved far more important than was at first supposed. In India the metre gauge (*i.e.* a little over 3 feet) has been proved, with skilfully designed rolling stock, to have as great a capacity as the broad gauge originally standardized in that country—viz. 5

feet 6 inches. In fact, the railways of India are now considered to be, generally speaking, over gauged, which means that a very large sum more than was necessary has been spent on the construction of the lines.* On the whole, therefore, and notwithstanding the serious drawback of our limited loading gauge, the British system evolved by commercial companies was probably as good as a pioneer system could be expected to be, and it does not seem reasonable to suppose that anything much better would have been attained had the Government taken over the task of laying out the lines, as in France. Indeed, the superior service which the Great Western gave in the forties, thanks largely to Gooch's high-pressure locomotives, might have led to Brunel (whose undoubted genius lent a dangerous attractiveness to his personality) being elevated by Government to the position of an autocrat over our railway system, in which case we should probably have suffered more from his scientific errors than from the empirical mistakes due to the commercial leanings of the Stephenson school.

Before the "mania" it seemed probable that Government assistance would be required, at any rate for such great works as a trunk line between England and Scotland; but when the epidemic broke out and investors began to "tumble over one another" in their eagerness to make all the lines the country wanted—and many that it didn't—the argument for Government financial aid, of course, disappeared. The promotion of lines needed to be checked rather than encouraged. Very much later on it came to be recognized that State

* This statement was contested in the discussion which followed the lecture at Birmingham; but my view has since been confirmed by Mr. Thomas Robertson, Special Commissioner for Indian Railways, who in his report, recently published, recommends the conversion of the Indian 5 ft. 6 in. gauge to the European and American standard, 4 ft. 8½ in.

assistance was needed for the provision of lines in the very sparsely populated districts; and this has been given to a moderate extent under the "Light Railways" legislation, but only in Ireland and Scotland. With this exception, railway construction in this country has been carried on by private enterprise, supervised by Parliament; but in regard to this supervision nothing like a consistent policy has been followed. Charters for what were considered unnecessarily competitive lines have frequently been refused; yet Parliament has never recognized the right of any railway company to monopolize a certain territory. Such a monopoly was, as a matter of fact, created under Parliamentary sanction in the case of the amalgamations resulting in the North-Eastern Railway; but about the same time, when the London and North-Western, Midland, and Great Northern wanted to merge themselves into a single undertaking the Bill was not allowed to proceed. Quite recently, however, the South-Eastern and Chatham and Dover Companies have been allowed to unite in a "working union." In short, each case has been considered on its own merits as it has arisen, and the claims of the shareholders weighed against those of the travelling and trading public. Generally speaking, our railways have been encouraged to rely for success upon their own exertions to please the public, rather than on territorial monopoly, and it is in such an atmosphere of healthy rivalry that commercial undertakings thrive.

As in supervising the laying out of the lines, so in controlling their working, the British Government has not followed any reasoned or consistent policy. From the first the charging powers of the companies have been restricted by the enactment of maximum rates for each class of traffic; but these maxima are, in the vast

majority of cases, above the amounts which the companies actually charge—which means that from a railway system laid out and worked on commercial lines the traders and travellers of the country have got better terms than from special legislation. Much more really necessary was the intervention of legislation to prevent the unequal treatment of traders or districts by what are known as preferential rates. Experience has abundantly proved that the commercial spirit, if left to follow its own free will, is apt to sink to a low level of morality and fairness; from which it follows that "undue preference" in rates, and other discrimination in the treatment of traders, are certain to be found on railways run on commercial lines, unless a higher power steps in to prevent them. In the long run such practices as these prove to the detriment of the shareholders as well as of the traders; and therefore Parliament consulted the general interest when it established in 1873 the special legal tribunal, known as the Court of Railway Commissioners, to adjudicate on matters at issue between the railway companies and the public; and also between one railway and another in questions of through routes and facilities. Similar remarks apply to the obligations which Parliament has imposed upon our railway companies with a view to safeguarding the lives and limbs of passengers and employees. The use of the most efficient safety appliances is, generally speaking, to the interest of the shareholder as well as of the traveller and the railway servant; but in such matters commercial enterprises are apt to be slothful or neglectful unless spurred by legislative enactment. In the cases of mines and factories similar legislation has been found necessary; and it is doubly necessary on railways, where the safety of the travelling public has to be thought of as well as that of the employees. Those apostles of

laissez-faire who thought that the enlightened self-interest of commercial men might be trusted to do all that was prudent and humane in this respect, have, I imagine, few representatives in the present day. Nevertheless, the point of view upon which I am insisting throughout this lecture, namely, that the railways of this country must earn dividends if they are to continue to flourish and develop—that point of view must never be overlooked in connection with such legislation as that to which I am now referring. In other words, Parliament must set up a practical and not an ideal standard of safety in railway working, remembering that the taking of risks—physical as well as financial—must often be a condition of livelihood in this workaday world.

Having briefly alluded to those forms of Government interference with the management of our railways to which, in my opinion, no serious objection can be taken, because the character and success of the undertakings as business enterprises are not jeopardized thereby, I pass on to deal at somewhat greater length with two other instances of Government intervention which, for the reason that they will not stand that commercial test, are to my view impolitic and unjust, and should not be persisted in. I allude to the Railway and Canal Traffic Act of 1894, and to the Workmen's Trains legislation. The former measure, it may be remembered, was a piece of "panic" legislation consequent upon the outcry which arose throughout the country when the revised schedules of Parliamentary rates came into force at the beginning of 1893. As if to show the traders how little the Parliamentary revision of the companies' charging powers had done for them, the railway authorities at that time withdrew a great many of the "special" rates formerly granted under stress of competition and for

other reasons, and required the traders to pay the full amounts of the Parliamentary maxima. This was an ill-judged piece of strategy, which recoiled with dire effects upon the heads of its authors. A new Parliamentary inquiry was hastily instituted; and as the outcome of a report, which took into account only the immediate situation, and paid no attention to the wider considerations of the case, an Act was passed by virtue of which the companies have thenceforward been deprived of the power of raising their rates (even within the limits of the laboriously fixed statutory maxima) in cases where such raising would bring the amount to be charged above the level in force at the end of the year 1892. In other words, not the limits of their charters, but the rates in force in 1892 are now to all intents and purposes the maximum charging powers of the companies; for, if any amount above the 1892 rates be exacted, the offending railway can be haled before the Railway Commissioners, and made to prove that the increase of rate is "reasonable." The Railway and Canal Commissioners, in their adjudications under this most unfair law, have made matters worse by setting up a rigid standard of reasonableness, which is artificial and unreal, because it has no vital relation to the conditions and circumstances which govern the conduct of railway business as a commercial enterprise. To prove that an increase above an 1892 rate is reasonable, a railway company must show that the cost of carrying the special traffic in question is actually higher than it was when the rate was originally fixed. This is unjust, for a number of reasons. In the first place, no figures are, or can possibly be, compiled by which such a proposition can be mathematically proved; secondly, railway rates are not, as a matter of fact, fixed by cost of service. If they were, the trade of the country could not be carried

on for a day. Thirdly, this unjust Act, as thus interpreted, practically penalizes the companies for introducing economies in traffic working, because every such improvement is liable to be used against them when they seek to raise a rate to meet some exceptional increase of expenditure. Lastly, it was most unfair that Parliament, having prescribed certain limits of charge within which the railway companies might carry on their business, and having encouraged, or at least approved, the expenditure of the shareholders' money on this basis, should pass an Act which practically annuls the companies' charters and deprives them of the very essence of commercial success, namely, freedom to conduct the selling part of their trade on business lines. From this Act have sprung, directly or indirectly, many of the subsequent misfortunes of railway shareholders; and it has put a serious check upon the raising of capital for those improvements in its transport facilities which the country urgently requires year by year.

Similar criticism, in my opinion, applies to the obligations which Parliament has put upon the companies of late years to carry working people to and from suburban districts at very low and unprofitable rates. Carrying on the line of thought that the railways of this country are first and foremost commercial enterprises, one cannot but see the unfairness of compelling them to do business on terms which, if not absolutely unprofitable in every case, are always relatively so, because lines on which the working classes travel in large numbers are always for that reason less popular with the better-paying classes of passengers. Far be it from me to argue that the working classes should not be given all possible facilities to live in the suburbs, but these facilities ought not to be exacted by law from

commercial companies to their own loss. This is brigandage in the guise of legislation. I know that compensation is supposed to have been given to the companies in the form of a remission of the passenger duty on third-class fares; but I see no valid justification for the exaction of passenger duty at all. In any case it was not a fair business transaction to take off a tax which the companies could to a large extent shift upon the backs of their customers, and to impose in its place a liability of unknown extent which must become more onerous every year as cities grow in size, the cost of railway enlargement increases, and the rating of railway property goes up. If the working man and woman must, in their own and the public interest, have special facilities for travel to and from their work, the fair thing to do is for the Government or the local authority to subsidize the railway companies which provide the cheap trains.

To sum up my lecture to this point: In this country we have secured, under Parliamentary supervision, a commercial system of railway transportation which, for an industrial community such as ours, has a big balance of advantage over a State-owned system, a State-guaranteed system, a millionaire-managed system, or any other system which exists or you can imagine. But if you are to retain this system you must treat it fairly. It is a hardy plant and can stand rough weather, but it cannot remain sterile. It must bear fruit or it will inevitably wither. Give the investor a fair dividend, and he will go on finding the capital for new lines and improvements. But if, by legislation or local persecution, you render railway shares no longer profitable, then the only alternative is a State system of railways, which is alien to the genius of a highly organized commercial community such as ours.

I am aware that there are critics—one comes across them just now in almost every newspaper—who assert that the return yielded by railway capital is small because the lines are not properly administered. This is the gist of the so-called "railway reform" agitation of the hour. It is not possible this afternoon to examine in detail the allegations of these critics; but it is, to say the least, inherently improbable that their arguments and assertions should be correct. A State railway system might have lagged behind in regard to improved methods of railway working; but commercial companies, keenly competing with one another, have every inducement to keep abreast of the times. It is a hard thing to believe—yet this, in effect, is the assertion of these critics—that our railway boards and managers are, without exception, blind to their own interests and incapable of the work they are appointed to do. Of course there is much waste and extravagance resultant from a competitive railway system; but it is not to be supposed that the waste would be less, though probably it would take a different form, if for competition were substituted monopoly.*

There is, however, a side to the question in reference to which the trading and travelling public may fairly address a word of warning to the railway shareholder. (By the way, though for practical convenience I treat

* I retain this paragraph as I delivered it, but on further consideration I am not quite satisfied with it. A whole lecture might be devoted to the relative advantages of company and State railway management—of competition and of monopoly. The marked economies recently effected by some of our companies under stress of adverse conditions certainly suggest some previous laxity of management attributable to prosperous ease. But the critics, I fancy, do not appreciate how much of this recent economy is the result of judicious capital expenditure on widenings and other improvements—expenditure which could be lavishly indulged in a few years ago owing to the cheapness of money, and which is now bearing abundant fruit.

these as two separate classes of the community, as a matter of fact they are not so to any large extent. Those who use the railways most for trading and travelling purposes are usually also considerable shareholders, and one often encounters the paradox of a man in his capacity as trader or traveller blaming a railway company for not doing something which in his capacity as shareholder he would equally blame the company for doing, and does as a matter of fact blame them for when his shareholding interest is uppermost in his mind.) The prime consideration with the shareholder is, as we have already remarked, his half-yearly dividend. He wants the highest return possible on his investment, and he does not want to wait for that return longer than can be helped. Hence, owing to the predominance of the shareholders' influence upon English railway policy, it has always been the custom to divide the profits of each half-year or year "up to the hilt," subject only to a more or less liberal current expenditure for the maintenance of the property. Then the nett profits are divided up amongst the shareholders as far as they will go, an amount being "carried forward" to next half-year, usually because it was not possible to squeeze out another ¼ per cent. In some cases, indeed, when an unusually high maintenance expenditure has had to be incurred during a particular period, part of the amount is placed to a "revenue suspense account," to be liquidated out of the profits of future half-years. Maintenance is, in some cases, it is true, provided for on so generous a scale as practically to amount to "betterment;" but, on the other hand, in other cases the maintenance allowance is so niggardly as to involve the "worsement" of the property. Yet, however the practice of the several boards may vary, the principle upon which they act is the same in all cases, viz. to charge to

revenue all that is necessary to keep the line up to its original standard of efficiency, and to charge practically every addition to its rolling-stock and the cost of all improvements and extensions to capital account, thus making the whole of the nett profits, after deduction of maintenance charges, available for distribution amongst the shareholders.

Now, opinions may and do differ as to whether "betterment" is a legitimate revenue charge, and as to where exactly the line between revenue and capital charges should be drawn; but, speaking broadly, the English railway practice has always been to give the dividend "the benefit of the doubt;" and it has now become pretty clear that under this system too high distributions have been made to the shareholders in the past, and that by the amounts so abstracted (plus compound interest thereon) the capital accounts have been unduly inflated. To a certain extent, no doubt, the present shareholders are paying for this by receiving lower rates of dividend than they would have had if their predecessors had not capitalized charges which they ought to have paid for outright; still, the travelling and trading public may fairly argue that they, too, are bearing a burden which ought never to have been put upon them; in other words, that the fares and rates charged to the public have to provide interest for a certain amount of capital which would never have come into existence if a sounder and more far-sighted financial policy had been pursued from the start.

The question is a difficult and complex one, and whilst convinced that the British practice has led to overcapitalization, I am not prepared to say that the practice lately introduced by certain American railway administrations, of having three accounts: "maintenance," "betterment," and "extension"—the first two

revenue accounts and the third a capital account—is a proper remedy for the evil. For this leaves the rate of dividend payable to the shareholders at the absolute discretion of the directors, who can enlarge or contract the betterment account exactly as they think fit, thus making the dividend practically little more than an optional "bonus." Such a course may be practicable in a country where the railway shareholders' power is mainly nominal, and where the presidents of the roads are practically autocrats; but, applied to British conditions, it would probably involve a fight at the shareholders' meeting over every dividend which the company declared. If it did not involve endless controversy, the change would probably lead to nothing more than the calling by the name of "betterment" of a part of the expenditure which is now provided for under the head of "maintenance." It is not human nature to expect that a body of shareholders will vote away their dividends for the sake of posterity, or even for their own benefit in a more or less remote and uncertain future.*

No, the matter is not one that can safely be left to the discretion of the administration, which means, under English conditions, to a shareholders' vote. The notion, too commonly held, that provision for the depreciation of the plant employed by a commercial undertaking is a voluntary charge made against nett profits for more or less substantial reasons, is a wrong notion fundamentally.

* A perusal of the official report of the last half-yearly meeting of the Great Northern Railway suggests to me that I may in this sentence have done an injustice to shareholders' "human nature." When the chairman of that railway stated that the directors had decided to build forty-five new engines in the following year as against twenty-eight in the past twelve months, and to charge the whole expenditure to *revenue*, a shareholder is reported to have cried "Hear, hear," and in the subsequent discussion no voice was raised against the proposal.

As a matter of fact, depreciation is a charge against receipts, and until you have charged depreciation you have not arrived at nett revenue. A railway company probably employs more plant liable to depreciation than any other class of industry; and it cannot surely be right that the annual loss from wear and tear should not be treated scientifically as a matter of accounting, but should merely be met empirically when the article concerned has actually worn out and has to be renewed. In many cases it is, as a matter of fact, not renewed, but replaced or superseded by something different which the changed conditions require, and the cost of the new thing is charged to capital account in whole or in part, thus involving risk of a duplication of capital. Surely it would be a more satisfactory method to compute the average working life of each article of the plant, and by dividing its original cost by the number of years it is likely to last, to arrive at a sum which could be written off capital account year by year by means of a depreciation fund charged against receipts as a regular item of working expenditure. It is no part of the obligation upon revenue to provide the money to buy new and improved equipment, and that is why a betterment account paid out of revenue is, in my opinion, a wrong thing, however right its intentions may be. But it is an obligation upon revenue to keep capital at its proper value by paying off the cost of articles which through wear and tear, change of conditions, etc., have gone out of use as earning factors. Therefore, I suggest that the risk of duplicating capital, which undoubtedly exists under the British method of railway finance, should be met by means of a regular depreciation fund, the form and precise operation of which is a matter for the accountants and auditors to decide upon. It might even be desirable for the Board of Trade to intervene and cause a fixed method of making annual deductions for

depreciation to be obligatory upon all railway companies.

I am glad to be able to reduce my subject at bottom to a matter of "accounting," because that is very properly one of the leading studies to which you are giving attention in your Faculty of Commerce; and I should like, if I have made my meaning clear, that the lecture this afternoon should be remembered by the students in that Faculty as one big concrete example of the importance of correct accounting; correct theory, even more than correct practice, because you can remedy false practice by "sacking" your book-keeper, but from accounts kept on a wrong theoretical basis evils spring which can hardly be remedied in eternity. You see I return to the remark with which I began this lecture, namely, that everything of and about a railway, which is really part of the railway, finds its true and only measure in the accounts of the undertaking; and I now go farther than this and say that, upon whether the accounts of its railways are properly kept, must depend the answer to the question whether the railway policy of a nation is sound or unsound. For whether the railways of a country be State-owned or State-guaranteed, whether they be managed by great capitalists or by representatives of thousands of individual investors, the aim of the Government is in every case essentially the same, namely, to give the people of the country the best and cheapest possible transport service which is compatible with a sufficient return on the capital invested. When the State is the owner, a smaller rate of return is generally found sufficient than when private individuals own the railways; but by taxpayer, bondholder, or shareholder some return is required, and the earning of this must be provided for in the rates and fares charged, and in the facilities

given. Hence follows the enormous importance of railway accounts being properly kept. For if the capital account be inflated, whether by the issue of "watered" stock, or by the capitalization of what are properly revenue charges, or by lack of allowance for depreciation, it is obvious that for all futurity, dividends have to be earned on sums which ought never to have come into existence at all. You have all heard of the philosopher who declared that if he might write the people's songs he cared not who made their laws. Similarly, one is almost tempted to say to governments, and particularly to the British Government, "Do not trouble about legislating as to the construction and operation of your railways, but see to it that their accounts are properly kept." In such a community as ours, with a keenly competitive system of lines, with a sufficiently alert body of traders and of shareholders, and a healthy and potent public opinion, there is really, as we have seen, little need for the Legislature to interfere in order to guard against injustice either to traders, travellers, or employees; and although, in certain respects such interference has undoubtedly been beneficial, in other ways it has done a good deal more harm than good. There is a sufficiently free play of opposing forces in this country for a fair approximation to be arrived at almost automatically between the rights and claims of the shareholders, users, and servants of our railway system—*provided that the accounts of the companies reveal accurately year by year what the true position is.* I need hardly say that I have not the slightest idea of imputing to our railway authorities as a class an intention to deceive. The railway administrators of this country enjoy, as a whole, a well-deserved reputation for honesty and straightforwardness in finance, for which we may well be the envy of less fortunate communities.

But when our railways were started, a joint-stock company, owning and working a large fixed plant, was a new thing, of which, indeed, our railway companies were practically the earliest examples; and even at the present day, notwithstanding the enormous development of joint-stock enterprise within the past half-century, the importance of providing for depreciation of plant is by no means given its proper value. It is too late to put the matter right now as regards the past; and both the shareholders and the customers of our railways must make the best of a condition of over-capitalization which has arisen, not out of financial chicanery, as in America, but from mere ignorance of the science of accounts, fostered by the practical necessity under a commercial system of giving the pioneer investors as high a return as possible on their money in order to encourage further investment. For the future, however, the matter should, wherever possible, be put on a sounder footing, though a certain amount of self-denial on the part of the present shareholders must be involved in the process of reform; and certainly, new companies such as the electric railway companies which are springing up in London should see to it that they do not repeat the old errors. To this end it is of the highest importance that Parliament and the public generally should grasp the fact that our railway companies, so far from being "bloated monopolists," to be plundered on all hands, have been reduced by recent legislation and a combination of adverse conditions to the position of a threatened industry, the proper development of which may be seriously checked if speedy relief be not given from some of the burdens which have been placed upon its back.

BRITISH SHIPPING, AND ITS PRESENT POSITION

Benedict W. Ginsburg

THE importance and complexity of the subjects comprehended in the above title make it almost impossible for one to do more, in the time at my disposal, than touch on the fringe of some of the more obvious questions which affect this most important national industry. I will not occupy any of it by dwelling on the hesitation with which I deal with it before business men. To an audience such as the present, it is perhaps unnecessary to dwell on the immense importance of her mercantile marine to the England of to-day. It carries on our over-sea trade, bringing in the raw materials for our manufacturers, and taking to our foreign customers their finished products; it finds employment, direct or indirect, for a large portion of our population, afloat and ashore, and gives a more or less remunerative outlet for capital; and, above all, it brings in for us a large proportion of the food on which every one of us subsists. Without our ships we should be starved in three months. Probably it is correct to say that there is more invested capital in the agricultural and railway industries than there is in that of shipping. But there are several reasons why shipping ought to be held to be a more important national asset than our railways. Much of the latter's capital, for example, has gone in law charges,

and in the purchase at compulsory prices of land which nevertheless would be practically valueless if science were to find a better means of locomotion. The shipping assets of the country, on the other hand, are constantly being renewed, and the renewals are generally of the latest type which experience and science are able to suggest.

It may be interesting to begin our consideration of the subject by a brief review of the statistical position. And for this I cannot do better than suggest to my hearers the study of the admirable series of five decennial papers which Sir John Glover has contributed to the *Journal of the Royal Statistical Society*. Exhaustive figures are set out, whilst the picture is illuminated by the deductions and reflections of a shipowner who analyzes the results of his long experience with sound discrimination. From the figures he shows us, it appears how largely, in the first place, the tonnage of our mercantile marine has increased during the last half-century; though, curiously enough, the absolute number of bottoms comprised in it shows a marked decrease. This, of course, arises from the increase in size of vessels, and from the replacement of the British sailing-ship by the steamer. Whereas in the year 1850 this country possessed 25,984 vessels, she only had 19,751 in 1900. The highest figure is shown in the tables in the year 1860, and since then the tendency has ever been downwards, the fall being most marked in the decade between 1880 and 1890. But, whilst the numbers are thus shrinking, the total capacity of the ships shows a vast increase. The nett tonnage, for example, which was but $3\frac{1}{2}$ million tons in 1850, rose to $6\frac{1}{2}$ millions in 1880, and to over $9\frac{1}{4}$ millions in 1900. But the whole tale of increase is far from being disclosed by the mere increase in tonnage, for in 1850 the bulk of our tonnage was in sailing-ships. We had but 168,474 tons of

steamships; although for some ten years previously our ocean mails had been transferred from the old Government packets to the paddle steamships of the various now historic companies. Now the sailing-ship, at least under the British flag, tends towards extinction, whilst the nett tonnage of steamships has risen to nearly $7\frac{1}{4}$ millions. Sir John Glover takes the efficiency of one ton of steam as equal to that of three tons of sail, though he admits that "such an allowance is grossly inadequate." I came across the other day an account of the beginnings of that successful company the Hamburg-American Line. It started modestly with sailing vessels, and of them it was stated that they did very well if they made two voyages across the Atlantic in the twelve months. Nowadays the vessels of the American Line make their round trips between Southampton and New York in a three-weekly turn; which, allowing for a rest and overhaul twice a year, would be equal to fifteen round trips. This, of course, is very exceptional work; but I would venture to think that four times the efficiency of the sailing-ship might well be allowed to the steamer. If this be so, we should find that whereas our effective tonnage, expressed in terms of steam, was but 1,016,000 tons half a century ago, it is now equal to 7,704,000 tons. This would seem to show a $7\frac{1}{2}$-fold increase.

The figures of entrances and clearances in ports of the United Kingdom do not seem on first inspection quite to bear out this relation; although one would suppose that they should, owing to the harder work of to-day, show it in even a stronger degree. But I think the fact that they do not appear to do so only shows how needful it is to consider every circumstance which may affect the scale in a matter of this kind, and to try and make the best allowances we can for it. In 1850, the total of entrances and clearances in ports of the

United Kingdom was 39·6 million tons. In 1900, it had risen to 208·8 millions, which is not much more than a fivefold increase. This hardly seems to accord with the relative increase in tonnage and efficiency, and puts us on examination. When we consider, however, we remember that the railroad system in the United Kingdom had by no means reached its full development half a century ago, and that there probably was a much larger proportion of home traffic sea-borne then than now. Let us, therefore, distinguish the coasting and foreign clearances in the totals I have mentioned. Now it appears that since in this home trade in 1850 over 25 million tons were entered and cleared, and but 110 millions in 1900, there was but a 4½-fold increase in the half-century. On the other hand, foreign entrances and clearances, which in 1850 were but 14·5 million tons (not so very much more than half those of the coasting traffic), had by 1900 increased so as to fall not so very far short of its record, with a total of 98·5 millions of tons. We here get a more probable figure, for the increase in the foreign trade is in fact nearly sevenfold in the period.

There are two other considerations which may possibly prevent the full value of the increase from appearing even in the foreign trade, though we have no means, that I am aware of, for ascertaining their exact value in figures. One is the great increase of the trade in British bottoms between foreign ports without any visit to our own shores at all. That business is a very lucrative one, but the figures of entrances and clearances at home ports can take no notice of it.

The other consideration is the fact that long voyages are more common now than they were formerly, and that therefore ships tend to do more and more work in proportion to their entrances and clearances.

From Sir John Glover's paper I also quote the figures of foreign entrances and clearances at British ports. In 1850 the total was just over 5 millions of tons; in 1880 this was increased to 17·3 millions, in 1890 to 20·3 millions, and in 1900 to 35·8 million tons. This is upwards of a seven-fold increase in the period. There is nothing to be alarmed at here, perhaps, though it may be worth while to notice that whilst the proportion of foreign to the total entrances and clearances was 34·89 per cent. in 1850, and 36·35 per cent. in the year 1900 respectively, it rose to 43·63 in 1860 and fell to 27·34 in 1890. Thus it may be argued that our hold on the home trade, though more thoroughly secured in the sixties, has since that time tended to be slackened.

Monsieur Kiaer, the Norwegian statistician, has given us some very valuable figures as to the growth of mercantile marines during the early part of the half-century just concluded. I will only deal with the figures of the more important countries, and will supplement these with figures obtained from Lloyd's register.*

	1850†	1860	1870	1880	1890	1900
Great Britain	3,159,583	4,668,980	5,827,476	6,881,323	11,928,624	14,261,254
Germany ...	498,838	807,644	1,004,755	1,171,286	1,678,446	2,650,033
France ...	658,297	1,008,957	1,084,559	963,568	1,082,674	1,350,562
United States	1,229,598†	2,021,852†	1,341,463†	1,328,239‡	1,943,443	2,750,271
Italy	150,030‡	206,947	883,487	1,005,972	828,158	983,655

I venture to think that the attempt to deduce any lessons from the percentages of increase which these figures would disclose might be somewhat fallacious. Germany and the other maritime states had so small relative totals in the earlier periods that a comparatively

* It must be noticed that these figures are not comparable with those quoted from Sir John Glover, his being nett and these being gross.

† Excluding lake vessels and river steamers.

‡ These are only the Sardinian states.

small addition to their stocks looms very large in mere percentages. Great Britain has added 2·25 millions of tons to her mercantile fleet in the last decade. The nearest to her in the competition is, of course, Germany, who has shown an increase of nearly 1,100,000 tons on her previous total. This in percentages would be an immense increase; but when we remember the conditions of phenomenal expansion in wealth, in population, and in maritime aspirations which that country has shown during recent years, I would submit that this increase is more a thing to be noticed as a possible warning than as a bugbear. The same might be said of the growth attributable to the United States. When we come to look at the French and Italian figures we cannot forget that we are regarding hot-house plants. The increase there is largely, if not entirely, due to the fostering care of the governments of those countries.

Just over a year ago, for a paper read before the British Association and subsequently published in the *Journal of the Royal Statistical Society*, I went into the question of shipping subsidies, a question which has of late very larely occupied the minds of the public. To me it appeared that it was necessary, in regarding this question of the development of shipping and of the advantages and disadvantages of State aid thereto, to begin by dividing the shipping into two classes. There are the ships which do the ocean trade of the country, shifting the manufactured goods and bringing in the raw produce to supply the factories and the food stuffs for the support of the mass of the people, and there are the fast mail and passenger steamers which fulfil immensely useful functions in their way by giving regular and expeditious communication between the various continents of the world for business men and for their letters, but which are a somewhat unimportant

aggregate as far as mere tonnage is concerned. These vessels, however, have great national importance from their high speed, which would make them very useful as auxiliaries to the war navies in time of national crises. I do not know why it is, but no vessel built for any navy has ever yet been able to accomplish a really long run at high speed. Possibly the relation of boiler power to cylinder diameter has something to do with it. We and other nations have war vessels with high paper speed accomplished on trial with picked coal, clean bottoms, and extra stokers. But the speeds so attained are probably never reached again in the life of the ship. With the mail steamer it is very different. When a ship comes out she does a certain speed on trial, but that is probably done with something considerably short of the maximum of which she is capable; and after she has made a few voyages she attains a mean speed over the whole course of several days across the Atlantic which substantially exceeds her trial performance, and that speed remains with her for a great part of her working life. We do not of course know what magnificent performance may have to be credited to H.M.S. *Good Hope* on her history-making voyage to South Africa with the Colonial Minister. But at the time* of my writing I am able to say that the fastest long-distance steaming for a war-ship was done by the United States commerce destroyer *Columbia*, several years ago, when she sailed to the eastward from Southampton with the avowed intention of seeing what she could do on a three-thousand-mile run. Before starting she was dry-docked, her deck hands supplemented her stokehole staff on the run, and yet her speed did not reach the 20-knots

* The anticipations of a fast run by this ship were doomed to disappointment. On one day indeed she did 18·8 knots, but on others the average fell as low as 12·4 and even 12 knots for the twenty-four hours.

standard which is attained by so many of the modern mail steamers of the Atlantic fleets, and so far exceeded by our own Cunarders *Lucania* and *Campania*, to say nothing of the faster and more recent German flyers. As long as this is the case, in spite of what naval men say, there must always be a place for fast merchantmen in supplement to the more purely military vessels of modern navies. The experience of the United States in their war with Spain showed beyond all controversy how useful mere 20-knot merchantmen could be with their power of lengthened cruising, and their great weatherly qualities. These conditions are undoubted; and it was therefore natural that thoughtful persons viewed with alarm the fact that when the Atlantic steamship companies had built the 20-knot *Majestic* and *Teutonic* for the White Star Line, and the 22-knot *Campania* and *Lucania* for Cunard's, there was an end of fast building. The Germans went ahead and built first the *Kaiser Wilhelm der Grosse*, then the *Kaiser Friedrich* (which has not been quite as successful as was anticipated). These were followed very rapidly by the *Deutschland*, the *Kronprinz Wilhelm* of still greater speed, whilst the *Kaiser Wilhelm der Zweite* is now coming forward. Meanwhile the English companies built the *Oceanic*, of only 20 knots, because greater speed did not seem remunerative to them; and then both companies fell back to building such ships as the *Celtic* and the *Cedric* of the White Star Line, and the *Saxonia* and *Ivernia* of the Cunard Company. These are ships which do not pretend to speed: on the Atlantic voyage they take approximately two days longer than the great racing ships, but they offer passengers freedom from vibration, wonderful steadiness in the seaway, and roomy state-rooms—even in many cases separate bedrooms, and that at prices which, in comparison with the

fares charged by the mail steamers, are exceedingly moderate. The German companies, it should be added, also found that this class of ships was remunerative to them, and both the Nord Deutscher Lloyd and the Hamburg American Company have put many such ships—though not perhaps of quite so large dimensions as our own—on the station. It is not altogether difficult to see why shipowners prefer the slower vessel. In the first place, they cost much less to build; the *Ivernia*, for example, would not cost half as much as the *Kaiser Wilhelm der Zweite*. Her horse-power is about one-fourth of that of the German ship; and this means, not only economy in construction, but also very much less expense in running. The engines of the two ships will be of much the same type, and so the British vessel burns a quarter of the German's coal, and has an engine-room staff relatively so much smaller. She has accommodation for a good number of passengers of all classes; but owing to the more popular rates which she can charge, and to the smaller numbers she can take, she will all the year round get a remunerative list. We do not know what the forthcoming ships will be, but the *Deutschland's* experience has shown that from November to April it is not worth while to put to sea. Thus depreciation, interest, and insurance run on all the year, whilst earnings to cover them, and to make a return to the investor, have to be made in about half the time. The *Ivernia*, again, carries a great cargo—probably some ten thousand tons—besides her passengers, whilst a fast mail boat can only find room for her coal, her mails, and a few hundred tons of measurement goods.* Is it wonderful,

* Hence it appears that there is no point in the argument of those who would object to the granting of this subvention on the ground that it is an undue preference to these mail steamers, and a hardship to the unsubsidized cargo vessels which ply between the same ports. The mail steamer's rates

then, that some aid has to be sought from the State by the shipowner if the public wants him to build flyers?

Our own Government has not of recent years taken any pains to encourage the shipowner. They saw that shipping was fairly prosperous as a whole, and they had taken to heart the principle, sound if fairly carried out, that trade is best left alone by Government. But this excellent principle they have not maintained. Our shipowners had the advantage of cheap coal, cheap labour, and cheap iron, and so they had cheap ships—since ships are largely the product of labour, coal, and iron,—and they had the further advantage of the skill and experience of our then unrivalled ship-builders and engineers. But Government interference followed. The business of the shipowner was regulated. The Board of Trade began to insist on certain precautions being taken with a view to the safety of the lives of those who manned the ships. There were devised various regulations as to manning, and as to the space and food to be provided for the crews. Then there were life-saving appliances to be carried, and a load-line to be marked on the ship's side. All these were excellent things in themselves, and things which conduced to safety. But they all penalized the shipowner, and reduced his gross profits, in competition with the unregulated foreigner; and it is needless for me here to insist that an apparently small diminution of gross profit may cause the nett profit to vanish, or become a minus quantity. Moreover the provisions of the Acts were not enforced with any consideration of the shipowner's interests.*

are so high, and she carries so little, that there can be no real competition between the two.

* Things are very different now under the present Secretary of the Marine Department. Restrictions remain, but shipowners and their difficulties are never forgotten.

Other legislative causes, which have operated against the British shipowner, have been the Merchandise Marks Act, and the law which enforces the payment of Light Dues. Our ships have had no assistance in return for those limitations. The Government has paid for work done, but that has been all. In the case of the Atlantic ships, it has given a payment at so much a pound for the carriage of mails; but the British ships have only received payment for what they actually carried, whilst the American and German ships visiting Southampton have had opportunities of earning at the same rate for the mails which they were given by our post-office in competition with our own ships. The American Government pays about £130,000 a year for the weekly mail service of about 20 knots speed, carried on by the line under its flag. The French Government gives a still higher subsidy to the Compagnie Générale Transatlantique, but it has stipulated for a service which will eventually be carried on by 22-knot vessels—two of which are already at work. The German Government is always said not to subsidize its fast ships, but to ascertain the truth in this matter we should have to arrive at an exact definition of what is meant by "subsidy" as distinguished from "payment for work done." My own idea is that the expression "payment for work done" is very liberally construed in Germany. I will quote a speech made by Herr Platte, the able President of the Nord Deutscher Lloyd Company, on the occasion of the launch of the *Kaiser Wilhelm der Zweite* the other day—an occasion which was certainly one on which he had every right to be elated. I take the words from an American paper. They do not seem to have been noticed in the British Press. He spoke of an inquiry by a Frenchman as to whether or no "the German Emperor assisted shipping and ship-building

out of his private purse," adding that, in the recent inquiry before the Shipping Subsidies Committee in this country, the advance of German shipping industry had been ascribed to subsidies. He proceeded to admit that "neither the Frenchman nor the Englishmen were entirely wrong. They simply did not correctly understand the matter." "The assistance, however," he went on to say, "that our shipping circles receive from the German Government is not expressed in cash payments or premiums, but consists of the general protection afforded commerce and travel by the Government through a grand far-seeing commercial policy, and the aids rendered commerce and travel by anticipating their needs in a practical way. The so-called subsidies received by shipping circles are nothing but the fulfilment of obligations in consideration of the extensive, onerous, and exacting requirements demanded of the German steamship companies." Now, we are accustomed to say that what the French Government pays to its great Atlantic Company is a subsidy pure and simple. But it surely "demands in return extensive, onerous, and exacting requirements," and so, by the same standard, it would appear that the Compagnie Générale might claim that it, too, is unsubsidized and merely paid for work done. We know that the German Government gives a preferential scale of railway charges to shipbuilding material, and that it also allows it free customs entry, and there is reason to believe that there are other, and perhaps more solid, aids which are not disclosed. At all events, we may claim, that shipping in this country has not had in the recent past the aid of a "grand commercial policy" on the part of its Government.

To sum up this part of the question, I would say that the increase of cost for further speed over 20 knots

moves in a geometrical progression, and that even on the Alantic speed over 20 knots cannot pay without Government assistance. It may be remembered that when the Shipping Combine was first put forward it was said that one of the economies to be effected by combination would be attained by the possibility of a reduction in the speed of the existing vessels which the union of interest would effect. If, then, governments, either for possible military exigencies or for postal reasons, wish for high speeds, they must be prepared to pay for them ; and it is because it is a recognition of this principle that I welcome the agreement with the Cunard Company at which our Government has recently arrived.

In the policy of the French and German governments with regard to subsidies we have examples, I think, on the one side, of how things should not be done, and, on the other, of successful State aid. The French spend an enormous amount of money every year for the purpose of encouraging their mercantile marine. Yet its expansion is slow enough. The reason seems to me to be, not that *all* State aid is bad, but that State aid unwisely applied does not, and cannot, produce the desired effects. The French give a bounty on shipbuilding. The result of that has been to enhance the cost of French shipping to such an extent that, even though ships built in the country are put on exceptionally favourable terms for bounty earning, it scarcely pays to build them there. Uneconomical methods and the lack of healthy competition have absorbed the amount payable as bounties without at the same time really benefiting the shipping industry itself. Then as regards the payments made by the State direct to the shipowners. These are made in the majority of cases without reference to the class of

work done. They are simply at the rate of so much a mile for every sea-mile traversed by a vessel built in France; and in the result it is found that voyages have been made simply to secure the bounty. The French consumer has not benefited any more than the shipowner by the low freight payable. Then there has been the State encouragement to the building of sailing-ships in spite of the fact that experience elsewhere has shown that, under normal conditions, owing to the recent great improvements in marine engines, the steamship is really superseding the sailer in most trades. Our own sailing fleet tends towards extinction. La Compagnie Générale, for its transatlantic service at an exceptionally high speed, has been put under its new contract on special terms. But the Messageries, the oldest of their companies, a line which at one time "almost monopolized the steam tonnage in the French mercantile marine," to quote the words of a great authority, has fallen on bad times. It is in process of reconstruction, and its managers attribute the evil days upon which they have fallen to the recent re-arrangement of the bounty system, which they allege tends to encourage the construction of cargo vessels at the expense of the mail vessels.*

When we look to Germany we see things entirely otherwise. There is seen no payment without adequate return. Indeed, in some cases we see the return and can only suspect the payment. But the national marine has encouragements of a substantial, though indirect

* The directors of the Chargeurs Réunis, one of the most important French shipping companies, report that the result of the recent alterations in the law will be to discourage the use of the older ships—a good thing so far as it goes. Further, it will make the employment of modern cargo vessels of large tonnage most profitable to the shipowner, and they are about to raise a considerable amount of capital in or to reorganize their company on these lines.

kind, and its way is made easy to it. The managers of the great shipping companies are honoured by the Emperor; the distinguished seamen of the mercantile marine are decorated; and payments are made when it is seen that these may be beneficial to the country as a whole. Take the case of the German East African Line. The British India Company, a well-managed and successful British company, already in touch with Aden and Mauritius, tried to open a branch line down the East Coast. It lost in the experiment some £40,000 a year, and then gave it up. A private concern could not do otherwise. Then the Germans, finding that £40,000 was the measure of the loss by a properly worked concern, offered a £40,000 subsidy for a similar service. They left then the contractors to make any profit on their undertaking to their own efforts. They were merely aided to meet the initial losses which it was realized must be involved. In the result, after losses beyond even the £40,000 a year had been incurred, the tide turned and a handsome return was secured. Money was eventually made for the shareholders, whilst employment was found for German ship-builders, German operatives, and German seamen. We must not lose sight of this use of State assistance to purchase a market.

Another point in which we stand at a disadvantage in comparison with other shipping countries is in the fact that we have no preserves for our shipowners. All our trade is free. It is far otherwise elsewhere. The trade from Havre to Marseilles is a "coasting trade" closed to foreign ships. So is that from San Francisco to New York and from Hawaii to San Francisco. Imagine what it would mean to our shipping industry if, not only that between Liverpool and London, but that between Sydney and London were declared "coasting trades,"

and closed to the foreigner accordingly. I do not advocate this being done. Please do not misunderstand me. But I want merely to instance an advantage which foreign shipowners receive at the hands of their governments from the purse of the general mercantile community, and which ours do not touch.

Space will hardly allow me to deal with another most important aspect of the shipping question—that which involves "rings," as they are called by their enemies, or "conferences," as the shipowners prefer to denominate them, and "combines." The conference which at the moment engages most attention is that in the Cape trade; but the earlier, one, and that which settled the law on the point, is that in the Far Eastern trade. A conference is a combination of shipowners—some British, maybe, and some foreign—who agree on a rate of freight which they will charge by their steamers. They work in their ships with one another so as to afford suitable dates for despatch. They then inform shippers that, though their rates are such and such for certain classes, they will allow a rebate of say 10 per cent. to all shippers who, for a period of, say, twelve months, ship exclusively by the steamers belonging to the conference lines. Thus rates are maintained and competition kept out. For no shipper will be tempted for the sake of a cheap quotation by a stray vessel to imperil the rebate on his twelve months' shipment. In the Eastern trade the conference steamers can give pretty well a despatch a day. No opposition, of course, could offer these frequent sailings, and there is no opening for the stranger.* In the Cape trade

* With a view to breaking down the "ring," about whose actions some of their members complain so bitterly, certain Chambers of Commerce have recently passed resolutions calling upon the Government not to grant mail contracts to those lines which infringe the rules which they consider proper as between the shipowner and the cargo owner. Now, it seems to

an attempt is now being made by an opposition to break the ring. Goods are being carried from New York to South Africa, for example, by the newly started line at wholly unremunerative rates. But what does it all mean? Merely that the conference keeps its doors tightly closed, and that those who run the opposition resent a refusal to admit them to the select body within. Their success would not mean lower rates for the shippers, but a share of the good things which the conference is supposed to give to those who are able to demand them.

This brings me to the last point I am able even to notice. In the old days when ships were fewer and smaller than they now are—and how much smaller and how vastly fewer they were I do not think people

me that those who pass such resolutions do not understand the first principles involved. What right has the Government to do any such thing? A steamship company is not a railway which acquires—for what is conceived to be the public benefit, though it be—a monopoly of transit in certain directions and compulsory powers of purchase from ordinary individuals. The shipowner has, or ought to have, the general protection from the law which every trader has. He ought also—so long as he keeps within the law—to have full power to carry on the business to which he devotes himself in his own way. The State has no legal right, therefore, to limit the charges he may make. It can only fix statutory maxima in the case of railways as part of the price they pay for the parliamentary monopoly granted to them. Parliament does not, and cannot, limit the number of steamers or the number of lines trading say between London and the Cape. The law of supply and demand is the only law to affect this; and accordingly the number of opportunities for shipment increases when much cargo is offering and declines when trade is slack. But the Chamber of Commerce seem to argue that through the mail contracts the State has a hold on certain shipowners. So it undoubtedly has. But that hold is only a contractual one. Whatever the Government demands under such a contract it must be prepared to pay for; and if the suggestions were to be carried into effect, the Post Office would be penalized in order that certain special regulations regarding freights should be thrust upon the mail contractors. Mr. Gerald Balfour's recent remarks do not show that he has grasped the essential distinction between railways and steamers which I have tried to indicate.

generally recognize—they were wont to be held in sixty-fourths. That is to say, a British ship, to have her rights as such, had to be registered at the Custom House. The smallest share which could be so registered was a sixty-fourth. The following table—which I hope I may be forgiven for quoting—shows the relative sizes of ships at about the date when this legislation was availed of to the full. Even if the old sailers cost, say, twenty pounds a ton, a sixty-fourth of such a ship was not a very large investment.

NUMBER AND TONNAGE OF VESSELS BUILT IN THE UNITED KINGDOM IN THE YEAR ENDING JANUARY 5, 1833.

	No.	Tonnage.
Under 50 tons	216 ...	6,257
From 50 to 100 tons ...	207 ...	14,382
,, 100 ,, 150 ,, ...	79 ...	9,656
,, 150 ,, 200 ,, ...	70 ...	12,056
,, 200 ,, 300 ,, ...	146 ...	35,623
,, 300 ,, 400 ,, ...	31 ...	10,340
,, 400 ,, 500 ,, ...	8 ...	3,438
,, 500 ,, 600 ,, ...	1 ...	501
Above 600 tons	1 ...	672
Total ...	759	92,915

The one-pound share and the working-man investor were in those days still undiscovered. So the sixty-fourth share really supplied the public needs. Practically all ships were so registered ; and on public grounds the law, which did not recognize trusts in the ownership of vessels, laid it down that no British ship, or any part of her, could be registered in the name of an alien. As long as this practice of registration continued, the law achieved its desires. But the increase in the size of vessels and their necesssary organization into lines to give regular opportunies for despatch necessitated a gradual change in the mode of ownership. Great steamship companies were organized. The earlier were

such as the General Steam Navigation Company, the City of Dublin Steam Packet Company, the P. & O., and the West India Royal Mail, which were constituted under royal charters. Then came the day of the joint stock company and its entry into the field of ship-owning. An ordinary, limited, company, properly constituted under the Limited Liability Acts, is a "person" in the eye of the law; and naturally, being registered at Somerset House and subject to the laws of the realm, with its registered offices in Liverpool or London, it was held to be a British subject. But there is no law which restricts the possession of shares in ordinary British Companies to British subjects; and so the anomalous position was reached, whereby a sixty-fourth in a British ship cannot be registered in the name of a foreigner, but an alien can nevertheless hold the whole capital of a British company, and so control the whole of a great fleet, or combination of fleets, of steamships. In justice to our rulers I should point out that the possibility of the adverse use of the anomaly in our law has only just become apparent. We have for long had American capital owning ships under our flag,—the old Guion line, founded in 1866, was a case in point. But it was thought, and not altogether unreasonably, that the country benefited by having the use of foreign capital for the development of its mercantile marine. It was only recently that the aspect of things changed. We had amalgamations in the past,—such as the union of the British and African Company with the African Steamship Company, and the subsequent aggregation of shipping enterprises under the *ægis* of Sir Alfred Jones. We had the absorption of certain smaller lines by such companies as the P. & O. and the British India. We had the purchase of the feeders by the great German Lines, and the amalgamation of the Union and

Castle Lines in the Cape trade. But these things had their reasons, and were, if I may say so without offence, genuine business transactions.

The recent history of the circumstances which led to the institution of the Shipping Trust may be detailed in a few words. There was a Liverpool line of large steamers engaged in the Boston and Mediterranean trades. Its name was the Leyland Line. It was successful and well managed. In the year 1900 several of its ships were engaged in useful and lucrative work for the British Government in the transport service to South Africa. Shipping affairs, in consequence of the military demands on the best class of shipping, were in a very booming condition. There was another Liverpool company, the West India and Pacific, which also had certain vessels of its fleet similarly engaged under highly lucrative charters to the State. The West India Company was in an extraordinary strong position financially, its return in 1900 being exceptionally good. Every one connected with the business was fully satisfied with his investment. There was no desire for any alteration. Suddenly, to these contented capitalists—men who knew their business and its possibilities—overtures were made by the Leyland Company to purchase them out. This was not a case of a forced sale, nor even of a willing seller. It was a pure case of making an offer which a satisfied holder could not resist, and that at the very top of the market. The West India Company's people closed with the dazzling proposals—as, being wise men, they were bound to do—and were brought out, getting their full price in cash,—this cash basis being an important fact to notice. The Frederick Leyland 1900 Company, Limited, was then organized, and the amalgamation of the two fleets complete. Though the company was registered here, and

though the ships remained under our flag, it was understood at the time that the eventual control of the new company was American, as indeed the methods pursued indicated. But it was felt by those who watched the position that there could be little real loss to our people by the transaction. For the Americans were giving high cash prices to British investors for old ships, and no one could complain of money coming into the country for ships which could be promptly replaced with new instead of obsolescent, and that at a price which would leave a good surplus in the hands of useful British capitalists. But the reorganization and the Americanization of Leyland's was but the beginning of things. The fact that the railway magnates of the United States had the control of Leyland's was used to frighten our shipowners with threats of a closing of the Atlantic trade to vessels which were not in touch with the railroads on the other side. There were hints of a possible boycott. At the same time overtures were made to the famous White Star Line to induce it to sell itself to those who now had the Leyland, the American line (with its various subsidiary branches), and the Atlantic Transport Company under their control. A tempting price was offered, and it was accepted. The Dominion Line followed, it being largely controlled by the great shipbuilding firm, Messrs. Harland & Wolff, of Belfast, who had so close a connection with the White Star Company. The same considerations brought in the Holland-American Line, and complicated working arrangements secured the co-operation of the two great German companies.

Now, what is the situation? Let us take the White Star Company's position for our examination, it being the best known and most important of the whole. The capital of the company was three-quarters of a million in thousand-pound shares. But there seems no doubt

that the true value of the shares as dividend earners was four or five times their face value. The holders were dazzled by an offer of about £14,000 apiece. But this time it was not to be all a cash transaction, and that seems a point worthy of notice. The bulk of the shareholders only got the, say, five thousand pounds in cash which their shares were really worth, the rest is paper—preference and ordinary shares. This they imagine is for good will. But the value of paper, whoever may issue it, is only what it represents. The Combine's paper cannot represent White Star ships, because we have seen that the shareholders have had the cash which they represent. It cannot represent Dominion ships, because these shareholders, too, have been paid for their ships, and taken the money away. Nor can it represent American Line Atlantic Transport or Holland-American Line ships, for the same reason. All these companies have received cash for ships and paper for good will. The ships have been mortgaged to pay commissions and to get cash. Then there have been immense expenses in the flotation of the business. Some ten millions sterling have been raised on mortgage, and much of that has gone in commissions to those who arranged the deal, to compensate those who sold commission businesses to the trust, and to pay out those who would not, or could not, take paper. The money so spent is entirely unproductive, and it is gone for ever. The mortgages remain on the hitherto free ships, and all that has been gained has been the possibility of some economy in future working. Something may be saved in office expenses. Something important was to have been saved in the decrease of speed. But since the French and British governments have made their arrangements with the Compagnie Générale * and with the Cunard

* There is some talk of an arrangement between the Morgan Combine

Company, the proposed reduction of speed is no longer possible. The only real chance of making anything out of the deal is by the closing the American ports to non-combine ships, whereby a raising of freights might become possible, and the English consumer of American produce be made to pay interest on this inflated capital. I do not think that the commercial men of Birmingham will believe that a corner in so vast an industry is possible, and I do not therefore fancy that the Shipping Trust will be found a very serious danger to British trade.*

and the Compagnie Générale Transatlantique. But as far as appears it is at most but one which will equalize rates between the competitors—there is no real likelihood of the national character of the French ships being affected.

* The prices to which the stocks of Mr. Morgan's Combine fell when the market settled on opening seem to bear proof that the public is realizing this fact. For whilst the debentures remained at about their face value, the preference shares fell to just under half, and the ordinary to about one-tenth their nominal worth.

THE TRUST MOVEMENT IN GREAT BRITAIN

Henry W. Macrosty

THE best-known trusts are the huge amalgamations so common in America; but if we confine the name, and thereby our consideration of trust problems, to them, we simply isolate from the general movement of trade what is but one method of escaping from the rule of competition. Under the term "trust" we shall here include every organization of whatever form which aims at the limitation of competition. To confine our consideration to monopolies real or alleged is to overlook the essential characteristic of the trust, for monopoly is largely a matter of opportunity and managerial skill. The dominant feature of to-day is that men are seeking by every device in their power to overthrow or control that principle of competition which formerly was deemed the life-blood of industry and commerce. Nor is this a matter for surprise; for the individual producer depends upon profits, and during the last thirty years profits as well as prices have fallen. According to Mr. Sauerbeck, the average index number of the prices of 45 commodities, which for the eleven years 1867–77 was 100, fell to 79 for 1878–87, and to 66 for 1892–1901; the lowest yearly average was 61 in 1896; it rose to 75 in 1900, only to fall again to 70 in 1901,

and 69 in 1902. With lower prices, the share of trade required to produce a given income has necessarily increased ; and therefore competition has steadily become more intense, and the uncertainty of industrial life has deepened. At length men have revolted, and sought to escape from the tyranny which was crushing them ; and in a thousand ways they have sought to put bounds to competition. Though there have been a thousand failures, yet a resistless force sweeps them on in the search for a mode of industry which shall not be unprofitable ; and to-day, in almost every corner of industry or commerce, we find attempts being made with more or less success, and it is our present object to study some of the results of the different forms of combination.

Manufacturers and traders have for a long time formed associations for scientific or parliamentary purposes, to exert pressure on railways, or to oppose a common front to trade-unions ; and the spirit of union thus engendered has been easily turned to other ends. Thus, in the inter-trading rule of many of the building-trade associations of Lancashire, by which members mutually agree not to trade with non-members, we have a glimpse of a possible wide trade-organization of a co-operative nature. The joint-stock company system has lent itself to a similar development, a community of interest being established between several companies by their having the same directors. From the prospectus of Pease and Partners we take this illustrative extract :—

"Several of the directors of the Vendor Company are also directors of, or shareholders or partners in, other important companies or firms on the East and West Coasts, in which they hold a considerable, and in some cases a preponderating interest ; and trade-contracts have been for many years entered into, and are now subsisting, with such other companies or firms,

to the mutual advantage of the parties to such contracts."

This is indeed a very effective way of controlling competition; and if we consider the ramifications of the Furness interests, which run through companies with a total capital of about £13,000,000, or of the Vickers' interests, or the Keen interests, or the Bell interests, it is plain that we are dealing with influences as powerful as they are intangible.

Turning to organizations consciously intended to regulate production and sale—"associations," as we generally term them, "syndicats," as they are known in France, or "kartells," to adopt their German designation—we find a large number of bodies, varying from very loosely compacted and unimportant forms to highly complex and powerful unions. Treating them in order, according to the degree of control which they exercise, and adopting the classification of Dr. Grunzel, the secretary of the Central Union of Austrian Manufacturers, in his excellent book, "Über Kartelle," we come to—

1. *Associations for the Regulation of the Conditions of Sale.*—Their objects are simple and their powers limited. They fix the terms of delivery, rates of discount, length of credit, charges for transport, and similar general conditions. They are very common, and exist in most trades: the "sale-note" of the National Association of British and Irish Millers may be taken as a type. The work of the Corn Exchanges in fixing the standard samples of grain, according to which sales are made, is another example. On the whole, their activity is considerable within their narrow range; but their chief merit is that they accustom their members to the advantages of combined action.

2. *Price Associations* represent the next grade. Whenever the market is narrow there is an attempt,

usually successful, to control prices. The marked-bar houses in the iron trade form an early example; but as the market widened, and purchasers began to stipulate only for G.M.B. bars instead of specific brands, prices of the latter had to be dropped; though the control of the first-class houses over their own products may be seen by their maintaining prices at £7 10*s.* a ton through 1893 and 1894. In the early part of 1895 ruinous competition forced the second-class houses to institute the Unmarked Bar Association of the Midlands, which, at each quarterly meeting, fixed the list prices for merchant bars, plates, sheet, strip, hoop, guide, and wire iron for the ensuing three months, and also laid down the general conditions of sale. Briefly, its effect, like that of the numerous price associations which have followed it, is that it has given manufacturers a stronger control over a rising market; but, owing to the competition of outsiders, it has never been able to resist effectively a depression in trade. When, however, such an association commands a proportion of the product that is necessary for the market demands, it can always with impunity keep its price above that of outsiders who can only satisfy a small part of the demand. Competition and bad times almost always prove fatal; for the essential weakness of such associations is that, since they do not regulate output, they can control neither production nor prices. The ease with which they are formed is only equalled by their fragility; and association has followed association in the tube and boilerplate industries with melancholy rapidity.

The limits of the power of an association to control prices, and the conditions which it must observe, were well set out in the Official Statement issued by the Durham Coal Sales Association:—*

* *Colliery Guardian*, p. 362, 23 Feb., 1894.

"They are not unmindful of the fact that fluctuations in price, even of very large extent, depend upon circumstances which are extremely obscure, very difficult to foresee, and, perhaps, impossible to prevent. The association will seek to confine its operations within those strictly legitimate limits which govern any well-managed industrial enterprise; and it is hoped that the magnitude of the interests involved will permit it to form a better judgment as to the course of trade than can be done by any single member. . . . It is anticipated also that, without endeavouring to thwart the natural course of trade and of prices, a careful and continuous survey of the market, such as can be undertaken by a large combination of owners, may curtail, if not entirely prevent, those losses to which the trade has from time to time been compelled to submit. . . . The rise and fall of prices are, it is believed, largely beyond the control of any organization, even one as powerful as that now contemplated; but the careful watching of the changes may permit the members of the association to minimize or guard against dangers which they cannot altogether prevent."

The Association lasted only a year, though 80 per cent. of the owners joined it. The history of the North Eastern Association of Millers (1900–1901) shows the internal weakness of such bodies. Mr. Rank, of Hull, at the annual meeting of the National Association of Millers, 3rd May, 1901, said:—

"In arranging for fixed prices it will be seen that the worst-equipped and most unfavourably situated mills must be considered, and must, of course, make a profit; therefore the larger mills must perforce work at such a margin of profit as shall, and indeed does, invite outside competition."

Still worse is dishonest competition from within. He went on:—

"The miller whose word is his bond has to suffer, whilst some seem to be seeking every means for evading or overriding the spirit of the agreement. They give way to things that are demoralizing to themselves and to their travellers. Millers have in some cases substituted a better class of flour, which has been invoiced and charged at the price of the grade below it. They have wilfully and systematically allowed some people more discount than the rule permitted; they have allowed cartage to customers when the millers themselves have performed the cartage, and have offered to invoice flour at the net price after deducting the rebate, and then again allow the rebate as though it had not been taken off when the invoice was settled; and a very common form of underselling has been the invoicing of rough stuff, such as maize, oats, barley, and meals, etc., at such prices as showed a distinct loss."

Here every method of placating opposition had been tried—the fixing of prices by a majority, allowing a minority of two to veto an alteration, and the imposition of penalties for breach—but all failed. It may be noted that in the milling trade it has been found more successful to trust to the honour of the members, as in the Liverpool and London Associations, than to enforce compliance by fines—a noteworthy divergence from German practice.

Weakness does not, however, exclude the possibility of tyrannical conduct. Messrs. Denny & Co., of Dumbarton, last November disclosed an attempt by the Scotch Boiler-plate Association to boycott all purchasers who did not deal exclusively with the associated firms; and at the same time that association was prepared to supply boiler-plates for shipment abroad at £1 per ton below home prices. These practices savour unpleasantly of the worst American precedents. There have also

been complaints that the Lancashire Boiler-plate Association has kept up prices unduly high.

Three special forms of price associations require particular consideration.

(a) *The Birmingham Alliances.*—The chief features of these bodies were, first, a "scientific system of stock-taking," by which the average cost of production of all articles manufactured was ascertained. To this was added a percentage of profit, and so the standard list prices were arrived at. Secondly, an alliance was formed with the trade-unionists, who agreed to work only for the associated firms, who, in return, gave them a monopoly of employment, a ten per cent. bonus on wages, and a sliding scale based on prices. If any firm broke the agreement, its workpeople were called out and supported from a strike fund mainly contributed by the other employers; and a corps of private detectives was employed to detect evasions of the rules. While enterprising firms could retain the whole of their savings from improvements in manufacture, their less efficient competitors were kept in existence by the price list based on average cost. The union of all sections of the producers against the consumer had its natural result, and in 1899 prices and wages in the bedstead trade were double what they had been in 1891. Foreign competition was stimulated, and internal dishonesty produced practices similar to those described in the milling trade. At last three firms revolted, and the expense of maintaining their workmen depleted the common fund. In August, 1900, the Bedstead Alliance was dissolved, and the system, which at one time covered trades employing 20,000 persons, is thoroughly discredited—deservedly so, for such an "alliance" had none of the economic advantages of combination. Even when the system was in full swing, the profits of the bedstead

companies only averaged 7 per cent., showing great leakage, despite the high prices ruling.

(b) *The Proprietary Articles Trade Association* in the drug trade is typical of a form of organization spreading with some rapidity also in the grocery and baking trades. It was founded in 1896, and consists of manufacturing, wholesale, and retail chemists. Retail prices are fixed; and observance of the list is enforced by the refusal by all the wholesale dealers to supply any of the "protected" articles to a retailer who cuts the price of a single one. In 1902 the Association numbered 96 manufacturers and 2000 retail chemists out of 9000 in business, and controlled the price of 370 articles. The practice of selling patent goods at or below cost as "leading lines" has in this way been stopped to a large extent. The tendency of the plan is to make the retailer quite subordinate to the manufacturer, and to increase the latter's power of holding up prices. A particularly interesting variant of this movement towards the fixing of retail prices is afforded by the active endeavours of the Publishers' and Booksellers' Associations to abolish discounts and establish the system of selling books "net." This case also shows how organizations, not originally intended to control prices, are inevitably driven towards some attempt somehow to regulate their trade.

(c) *The Shipping Conferences or Rings* are essentially agreements among shipping companies to control freights over definite trade routes; and they practically dominate our over-sea transport. Regulation of freights is undoubtedly a commercial necessity, but the special feature of the Conference system is that a special rebate of 10 per cent. is allowed to shippers for exclusive patronage of the Conference boats; the rebate is only paid six months in arrear, and is forfeited if an ounce

of freight is in the interval sent by an independent steamer. Shippers having large sums at stake are thus bound to the "ring," which proves itself a trust as powerful as any in the United States. Nor is its tyranny one whit less than its strength. At present the Prince and Houston lines are fighting the South African "ring;" but though well-patronized, they cannot supply facilities for the whole trade, and the "ring" is not slow to use the opportunity thus offered. Customers of the independent lines are charged double rate for goods they have to ship by the Conference steamers; forwarding agents, who by special orders ship the goods of some of their clients by the Houston line are notified, as Messrs. Townsend and Mellor said, "by the ring that they will not accept any cargo from us for any of our principals except at penal rates;" * even the consignees are coerced to instruct their consignors to ship only by the "ring." Beyond these specific evils is the more serious fact that rates of freight appear to be fixed without any regard to their effect on British trade. Rates to South Africa are the same from British ports as from Continental ports; thus leaving German exporters the full advantage of the railway concessions made to them by the German Government. Again, while the rates from British ports are regulated and range from 22*s.* 6*d.* to 80*s.* per ton, freights from United States ports are subject to open competition, and vary from 10*s.* to 20*s.*, even in ships belonging to the Conference lines.

The same story may be told of all the Conferences. The Singapore Conference is composed of both shippers and shipowners, and the rights of each party are alleged to be maintained, though an extra rebate is given to

* *Letter* of Messrs. Townsend and Mellor in *Liverpool Daily Post*, January 10, 1903.

certain firms for the surrender of private chartering privileges. The British tramp has been driven from Singapore in favour of the Nord-Deutscher Lloyd, the Hamburg-America, and the French, Dutch, Austrian, and Dutch mail lines which are included in the Conference. Rates to London have gone up from 20*s.* to 38*s.* 6*d.*; and to the Continent from 21*s.* 6*d.* to 38*s.* 6*d.*; extra transhipment rates are charged so that "it costs 56*s.* per ton to ship tapioca to Leith or Belfast, and 50*s.* to Glasgow, against 42*s.* 6*d.* to St. Nazaire, Dunkirk, Rotterdam, Venice, Fiume, etc. Again, as an example, it is possible to ship to Havre and (or) Marseilles, direct or indirect, at one, and that the lowest rate; but we cannot obtain option of London and (or) Liverpool except at 5*s.* extra." *

Here we have a group of "trusts" which urgently demand legislative attention both as regards the prohibiting of rebates and some control over rates.

3. *Associations for the Reduction of Output.*—The weakness of price associations is, as already said, that they control prices only, and not production. The next step is one which manufacturers are loth to take, and usually it is first tried in order to relieve the market of an existing glut. Thus, in 1895, an attempt was made to restrict the output of tinplate in South Wales by one-third in order to relieve the market caused by the closing of the United States by a high protective tariff. It was openly charged that the leaders in the movement were actively engaged in building up the tinplate industry in America, and the policy was certainly not advantageous to the efficient manufacturers, who could afford to run their works at a low rate of profit. A similar policy of reduction is being carried out this winter for the same purpose of reducing a glut, and will probably result in

* *Liverpool Daily Post*, January 16, 1903.

keeping the least efficient firms in business a little longer, to the detriment of the industry. On the other hand, the Cotton Spinners' Federation in Lancashire has, in 1897 and 1900, temporarily made itself a kind of "kartell" to reduce output for a period, in order to counteract the machinations of American speculators, and in this way has smashed the "cotton rings."

4. *Associations for Division of Territory* are attempts to protect the standard prices by securing a definite territory within which they may prevail. They are not very common, and most usually apply to foreign trade. We may take them as treaties formed between associations or large companies or trusts. Thus last year there was an arrangement between the malleable iron makers of Scotland and the North of England not to poach on each other's territory. The "tobacco war" ended in an agreement to leave the United Kingdom to the Imperial Tobacco Company, and the United States to the American Tobacco Trust. The English Sewing Cotton Company, the American Thread Company, and J. & P. Coats, Limited, divided the cotton-thread trade of the world among them; but the allocation of territory did not prove satisfactory, and led to charges of encroachment and to quarrels. These are the weak points of this form of association, which, besides, does not possess any general economic advantages.

5. *Associations for the Regulation of Output.*—With this class we come to the first really effective attempt to control production in the interests of the producers. Their method of working is as follows. The books of the associated firms are examined by an independent accountant to determine the amount of trade secured by each over a period of three or five years prior to the agreement, and upon the figures so obtained are based the total amount of production, and the quota of each

firm for the period during which the agreement lasts. If any firm exceeds its quota, it must compensate the others according to an agreed scale; but a more effective plan is to require each firm to pay the surplus of its takings over the cost of production into a common fund, which is shared out periodically in the predetermined proportions. In this way a firm gets no advantage from exceeding its assigned production. The agreement also generally contains penalties for breach of the rules, and provisions for fixing prices and conditions of sale. Such associations are very common in Germany and Austria, and in England the Cleveland Steel Plate Makers' Syndicate, the recently resuscitated Steel Rail Manufacturers' Association, and the Gas Strip Association, constituted in July, 1901, are reported to belong to this class, but particulars of them are not available. The Gas Strip Association, however, is very strong, and soon after its formation beat out German competition by reducing prices 2*s.* 6*d.* per ton, after which it was able to restore the old rate of £6 15*s.*, and to retain for itself all the advantage of the higher prices resulting from the exceptional demand due to the Coronation.

One successful pooling association is the Corn Millers' Association of the North of Ireland, formed by twenty-three millers of Indian corn in 1900. The quotas were fixed on a two years' basis; a weekly record of sales is kept by the accountant; each member pays into a fund, administered by the accountant, 10*s.* for each ton of meal sold, and the total is divided monthly in the agreed proportions; disputes are settled by a referee; penalties from £100 to £200 are fixed; at the weekly meetings of the association prices are indicated but not fixed; the agreement has been renewed from year to year. The additional profits secured by this scheme

have attracted fresh competition, but no one has broken from the association. This is the great danger, for either the new rivals must be taken in, reducing the proportionate shares, or they force down prices. Thus the Nitrate Association, which has raised prices noticeably, has had since its foundation to admit new firms representing a capacity equal to 25 per cent. of the agreed total production, and the shares of the original members have been proportionately reduced. Another danger at periods of renewal is disputes as to the allocation of quotas according to capacity.

6. *Sales Associations.*—With these we reach the highest organization of terminable associations; they form the typical kartell of Germany. The associated firms confine themselves solely to the work of production; the function of marketing the total product is entrusted to a separate organization controlled by a committee of the association. The total amount to be manufactured and the proportionate share of each firm are fixed in the same way as in the pooling associations. All orders are sent to the sales agency, which distributes them among the firms, reserving to each as far as possible its old *clientèle* and allocating new business in the same proportions as the old. It also fixes prices, and decides as to the necessity of an increase or reduction in the total quantity to be manufactured. In this country the only Sales Association which has come into prominent notice is the Central Thread Agency, which marketed the goods of Messrs. Coats, Chadwick, Clarke, and Brooks for some years before these firms amalgamated. After their union it was continued for the joint sale of the threads of J. & P. Coats, Limited, and a foreign firm not in the combine, and at the present time it also undertakes the marketing of the goods made by the English Cotton Company.

In an association of this kind the sacrifice of independent action by the combining firms is so great that nothing more remains to be surrendered except their separate existence; and we thus appear to arrive without a break at the great amalgamations. Dr. Grunzel, however, and M. de Rousiers assert that kartells or associations such as we have so far been describing are essentially different from trusts or amalgamations. This cannot be conceded. All alike aim at the limitation of competition, the regulation of production, and the realization of the economies of combination, and only differ in that they secure these ends in different degrees, and that the one class are terminable associations openly temporary in character, whereas the others are as openly permanent. These differences are accidental, not essential; and we have a series of forms of organization developing in progressive complexity from the association aiming only at the regulation of the conditions of sale to the actual fusion of the once competing firms into one large new corporation. Dr. Grunzel goes so far as to say that he knows of no case of the development of an amalgamation from a kartell, but this lacuna can be filled up from English experience. The union of Messrs. Coats with the other three firms came out of the establishment of the Central Thread Agency; Wright, Bindley, and Gell—the umbrella furniture combine—is a development of a previously existing association; and the union of the Scotch malleable iron manufactures now being negotiated * is being built upon an existing association. In addition, it may be noted that many amalgamations, such as the Woolcombers, the Bleachers, and the Dyers, were built up on the ruins of unsuccessful associations.

* This union broke down on the verge of completion, owing, it is said, to disputes about the purchase prices of the respective firms.

The great majority of our largest amalgamations, especially those comprising a large number of firms, were designedly formed for the purpose of preventing the internecine competition which previous to their formation had been eating away profits. They consist of firms all exactly in the same line of business, all on one plane—"horizontal" amalgamations, so to speak. There is, however, another motive for combination, the desire to realize the economies of large-scale production, and this we can trace at work in the everyday business world. The first move is to get control of the supplies of raw materials—*e.g.*, many iron-masters own their own ore and coal-mines; the next is to absorb the industries ancillary to the main business of the firm—*e.g.*, Messrs. Colman, the mustard manufacturers, make their own tins and print their own labels. If the business is in the making of semi-manufactured products, the next step is to take over the subsequent processes of manufacture; until the whole series, from the extraction of the raw material to the delivery of the ultimate product to the final purchaser, is under the direction of a single will. For example, Messrs. Vickers, steel-makers, bought up the Naval Construction and Armament Company and the Maxim-Nordenfelt Guns and Ammunition Company in 1897, in order that they might be able to turn out a battleship complete in every respect; and in 1899 John Brown & Co., the steel-makers of Sheffield, who already owned collieries in Yorkshire, and iron mines in Spain, acquired the Clydebank Engineering and Shipbuilding Company for similar reasons. After this, development takes the form of the purchase of additional business, partly to extinguish or anticipate competition, partly in order to utilize fully the supplies of raw material and to increase the stability of the undertaking by widening the range of articles produced. These causes explain the

acquisition by Messrs. Vickers in 1901 of a half share in Messrs. W. Beardmore & Co., who had invented a new armour-plate, and of two small businesses for the manufacture of fuses, electrical fittings, and motor-cars. Similarly, the Patent Nut and Bolt Company became Guest, Keen, & Co. by the absorption of Guest & Co. and the Dowlais Iron Works for the sake of their rich supplies of iron and coal, and afterwards blossomed out into Guest, Keen, & Nettlefolds, by union with Messrs. Nettlefolds and Messrs. Crawshay, partly to end their mutual competition in rails, partly to establish their joint businesses firmly on the assured supply of raw material. We may say that while the first class of amalgamations are intended to control competition, the primary object of the second class is to secure efficiency. Or, continuing our former simile, we may say that the former develop "horizontally," the latter "vertically." Too much importance must not be attached to this classification; its principal use is to indicate the two main lines which development has followed towards the end of securing a practical monopoly, or at least such a predominance in the market as will enable the combination largely to control the price of its own products. "Horizontal" unions also aim at increasing their efficiency by economies in production, sale, and transport, by specialization of plants, and by the better utilization of expert knowledge and business ability; "vertical" unions also end, as we have seen, in amalgamation with competitors. Both alike result in the aggregation of large masses of capital. Many combinations seem to partake equally, even from the beginning, of the characteristics of both classes. The "vertical" form is perhaps to be preferred, since under it development proceeds gradually, each step being made secure before another is added, and not so much risk is run as in

the simultaneous amalgamation of thirty or forty firms. This merit is reflected in the dividend returns. On the other hand, the combine of J. & P. Coats, Limited, was formed to extinguish competition between the four constituent firms. Large investments were subsequently made in the English Sewing Cotton Company, and the American Thread Company, and the Paisley firm now has the former of these directly under its tutelage, and controls the thread trade of the whole world.

If we seek to determine the extent to which British amalgamations dominate their respective industries, we will find ourselves much hampered by lack of information. The Wall Paper Manufacturers claimed 98 per cent. of the trade in their prospectus; the Bradford Dyers' Association, the Bradford Coal Merchants' Association, the Aberdeen Comb Co., and the Textile Machinery Co., 90 per cent.; the Calico Printers and the British Cotton and Wool Dyers, each 85 per cent.; the Cement Manufacturers, 80 per cent.; the United Velvet Cutters, 75 per cent.; and W. Cory & Son and the British Oil and Cake Mills, each about 60 per cent. The Fine Cotton Spinners, the Yorkshire Indigo Dyers, the Rivet Bolt and Nut Co., the Linen Thread Co., and the English Velvet and Cord Dyers almost monopolize their respective trades; while the Bleachers' Association, the Imperial Tobacco Co., A. and J. Stewart and Lloyds, the United Turkey Co., the Metropolitan Amalgamated Waggon Co., and Rickett, Cockerell & Co., all occupy a dominant position.

The Fine Cotton Spinners have grown from 31 to 47 businesses; the Bradford Dyers from 22 to 33; the English Velvet and Cord Dyers from 11 to 22; the British Cotton and Wool Dyers from 46 to 51; the Yorkshire Woolcombers from 38 to 41; the Imperial Tobacco Co. from 14 to 19; the United Turkey Red

Co. from 3 to 4; and the Yorkshire Indigo and Scarlet Dyers and the British Oil-cake Mills have also absorbed several businesses since they were started. Of these combines the Bradford Dyers and the British Cotton and Wool Dyers have had to meet fresh competition, though not to any important extent. The Imperial Tobacco Co. has caused some regrouping among its rivals—Messrs. Cope Bros. having amalgamated with a London firm; the National Provincial Co., including Messrs. J. & F. Bell, of Glasgow, and three English firms, was formed in August, 1902,* with a capital of £500,000, and about the same time three English wholesale firms joined hands. Further united action has been threatened by the Wholesale Dealers' Association.

When we come to consider the financial results of the combination movement, we find that the iron combinations, which are mostly all of the "efficiency" class, did remarkably well in the three years, 1899–1901, when they enjoyed the effects of the "boom;" but that the bad trade which followed its decline will try the merits of the new system is undoubted. Thus Richardsons, Westgarth & Co. paid a dividend of only 6 per cent. in 1902, compared with 10 the previous year; and the South Durham Steel and Iron Co., which in 1901 showed profits of £105,680 compared with £125,834 in 1900, somewhat ominously announced in January of this year that while the result of the year's working might admit of the payment of the half-yearly preference dividend, they considered it judicious to wait until the accounts had been made up. Similarly, the shipping combines—such as the Shell Transport and Trading Co., the Union-Castle Line, Wilson's and Furness, F. Leyland & Co., France, Fenwick & Co., and

* In the summer of 1903 it was announced that it had not been found possible to carry out this amalgamation.

the Ellermann lines—did well over the same period when the rates for chartering and freight were abnormally raised by the heavy Government demands for transport purposes during the war. But the fall in rates which has followed is undoubtedly affecting them adversely, as, in fact, is shown by the reports of the P. and O. Company and the Manchester Liners, among others. In the wild anticipations which are formed of the powers and results of trusts, the experience of these two industries shows us that it is not possible to control deep trade movements. Cheap iron favours ship-building and low freights encourage trade, but neither alone can create a healthy demand. One industry recklessly conducted, or even one large financial house or manufacturing business, can cause a commercial crisis with ensuing depression; but the artificial production of good times is at present beyond our alchemy. The trusts must follow the course of trade; they cannot control it.

The "horizontal" amalgamations naturally excite more interest, since their object is the far-reaching one of controlling production. In trying to arrange them according to their degree of success, all lines of division run criss-cross through the industries; we cannot say that any trade is unsuited or more suited than others for combination. The successful ones which have equalled or exceeded their prospectus anticipations are—

Textile and allied industries.

- J. & P. Coats
- Fine Cotton Spinners' Association
- Bradford Dyers' Association
- Extract Wool and Merino Co.
- United Turkey Red Co.
- Linen Thread Co.
- English Velvet and Cord Dyers' Association
- Leeds and District Worsted Dyers' Association
- Yorkshire Indigo and Scarlet Colour Dyers

Coal.

- W. Cory and Sons
- Rickett, Cockerell & Co.

- Wallpaper Manufacturers' Association
- Fairbairn, Lawson, Combe, Barbour (Machinery)

Dividend-paying, but still not in a condition to be counted successes, are the following:—

	Prospectus.	1899.	1900.	1901.	1902.
Aberdeen Comb Co.	6	6	4	4	—
British Dyewoods and Chemicals Co.	—	2	3	nil.	2
Bradford Coal Merchants' Association	—	—	8	8	5
British Oil and Cake Mills ...	8	—	7	nil.	6
Barry, Ostlere and Shepherd (Linoleum)	—	—	7½	6	2½
United Indigo and Chemical Co. ...	8	—	6	4	nil.*
Bleachers' Association	6	—	—	nil.	3
J. and J. Baldwin and Partners ...	—	—	—	7	nil.
Rivet, Bolt, and Nut Co.	10	—	—	6	8

As to these we may briefly note here that just as the Fine Cotton Spinners and the Bradford Dyers suffered in 1901–2 from the bad state of the cotton and wool trades, so was the Bleachers' Association seriously affected, being an auxiliary industry; and its recovery under the influence of cheaper coal and peace in China, shows once more the dependence of the trust on general trade and political conditions. The British Oil and Cake Mills, and Barry, Ostlere and Shepherd show in their dividend results of the speculative market induced in 1901 by failure of the Russian linseed crop, and subsequent heavy arrivals from the Plate upsetting all calculations. The Rivet, Bolt, and Nut Co. has naturally suffered from the decline in shipbuilding, and a rival business established by a syndicate of Clyde shipbuilders has had to close. The improvement in the British Dyewoods and Chemical Co. is due to economies and concentration effected by an Executive Committee appointed in 1901; while the same causes, consolidation and economy, added to improved markets,

* Debit balance, £5292.

brought about the satisfactory restoration of the British Oil and Cake Mills to the rank of dividend-paying concerns. To these two factors we shall have to recur later.

The non-dividend-paying list includes the following :—

The Salt Union.
The United Alkali Co.
The English Sewing Cotton Co.
Yorkshire Woolcombers' Association
Textile Machinery Association.
British Cotton and Wool Dyers' Association.
Calico Printers' Association.
United Velvet Cutters' Association.
Associated Portland Cement Manufacturers.

Many other combinations have been omitted from these lists, either because they are local (like the Bath Stone Firms), or international (like Borax, Limited), or are too recent for results to be published (like the Imperial Tobacco Company). Only native industries have been considered. We may also clear the way for consideration of the last list by neglecting the Textile Machinery Association, a union of seven firms, with a capital of £290,000, and largely dependent on the woolcombing industry; and the United Velvet Cutters' Association, a union of five firms, with a capital of £140,000. The remaining seven companies will serve to exemplify some of the most important points in the management of trusts. Their results may be thus summarized :—

	Issued capital.	Market value, Jan. 1903.	Ordinary dividends.				
			1898.	1899.	1900.	1901.	1902.
The Salt Union (1888) ...	£2,600,000	£1,532,250	nil.	nil.	nil.	nil.	nil.
United Alkali Co. (1890) ...	8,420,550	4,189,897	nil.	nil.	nil.	nil.	nil.
English Sewing Cotton Co. (1897)	3,000,000	1,850,000	nil.	8¾	7¼	3¾	nil.
Yorkshire Woolcombers' Association (1899)	1,931,800	552,500	—	—	nil.*	nil.	nil.
Calico Printers' Association (1899)	8,226,840	5,740,762	—	—	nil.	nil.	—
British Cotton and Wool Dyers' Association (1900)	1,892,480	948,380	—	—	—	nil.	nil.
Associated Portland Cement Manufacturers (1900) ...	7,375,000	3,541,875	—	—	—	nil.	nil.

* Preferred ordinary, 5 per cent.; deferred ordinary, nil.

The Salt Union in 1902 wrote off £1,800,000 from its original capital of £4,200,000. The English Sewing Cotton Company passed its preference dividend for 1902 (year to 31st March), and showed a trading loss for the year of £127,000, or, including arrears of preference and ordinary dividend, £227,000. The Yorkshire Woolcombers' Association is now in the hands of a receiver pending reconstruction; though its trading profit for 1902 showed an increase of £23,000, it was still £48,700 below prospectus anticipations, and the debit balance was £18,074; and, when the receiver was appointed last November, there was a bank overdraft of £60,000. For the fifteen months ending December 31, 1900, the trading profit of the Calico Printers' Association was £446,000; for the following year it fell to £22,000, but for the half-year to June 30, 1902, it rose to the more satisfactory figure of £221,500, and a dividend seems almost in sight. The British Cotton and Wool Dyers have also somewhat improved, the trading profit for the fifteen months to March 31, 1901, having been £87,566, and for the following year £73,231, and for the half-year to September 30, 1902, £45,784. The vendors have also loaned the company £149,000 at 4½ per cent., and the executive directors have given a guarantee to a bank for £60,000. The gross trading profit of the Associated Portland Cement Manufacturers for the year June 30, 1902, was £279,242, or £31,500 in excess of the previous year, but the prospectus figures were £561,000. It would be scarcely fair to take the Stock Exchange values as necessarily an accurate representation of the true values of all of these companies; at least in the case of the Calico Printers and Cement Makers; but their situation is still sufficiently serious when compared with other concerns. To place against the English Sewing Cotton Company, J. & P. Coats, Limited;

against the British Cotton and Wool Dyers, the Bradford Dyers; against the United Alkali Company, Brunner Mond & Co., is sufficiently eloquent in condemnation. Even if we take the two concerns which have had to face bad markets, the Woolcombers and the Cement Manufacturers, the former compare badly with I. Holden & Sons (capital £652,500), who also paid no dividend in 1900, but rose to 2½ per cent. in 1901, and 7 per cent. in 1902; and the latter compare even worse with the Sussex Portland Cement Company (capital £132,638), which paid 15 per cent. in 1901, and 12 per cent. in 1902.

It is of the highest importance to determine the causes of failure and success; but naturally the successful undertakings do not disclose their secret, and therefore we must try to arrive at it negatively by ascertaining the causes of failure. These may be summed up as (1) attempting to force up prices; (2) over-capitalization; (3) bad management; (4) cost of raw materials; (5) running short time; (6) adverse trade conditions.

(1) *Attempting to force up Prices.*—The Salt Union were so confident of their monopoly that they estimated they could keep a trade of 2,000,000 tons a year, and raise prices 5*s.* a ton so as to produce 20 per cent. dividends. They did double prices, but fresh competition at home and abroad was stimulated. In 1901 their deliveries were only 903,000 tons, and no ordinary dividend has been paid since 1892. The United Alkali Company controlled the Leblanc patents for making bleaching powder, etc., and produced 83 per cent. of the output of four leading chemicals; but their monopoly only resulted in a rival process, formerly known only in the laboratory, being developed into a commercial success, and their gross profit fell from £923,693 in 1892 to £426,688 in 1901. Fortunately, these two companies have been unique in their price policy; their experience

has been enough to demonstrate that in a free-trade country any attempt at extortion brings a rapid punishment. The Wall Paper Manufacturers declared at their last meeting—

"There is no question of the public having to pay higher prices owing to our combination. On the contrary, we are delivering goods to-day at lower prices than those at which any separate concern could produce them."

The Bradford merchants recognized the Bradford Dyers' Association's "great efforts to keep abreast of the requirements of the trade," * and Mr. H. D. Sichel, chairman of the Manufacturers' section of the Bradford Chamber of Commerce, declared † that—

"The present directorate had shown itself to be most reasonable, and so long as they remained in office he believed they had nothing to fear from monopolies, boycotts, or anything of that sort."

On the other hand, most of the combinations at the time of their formation announced their intention of raising prices in lines and places where they had been unremunerative, and to this in principle no objection can be taken. The rise in coal and other raw materials has also caused an increase in prices. Material for deciding whether there has been any unjustifiable augmentation is not at our disposal; but we must not forget the temptation which exists, as the Investigating Committee of the Calico Printers' Association said—

"In most cases, where a business is converted into a public company, and to a greater degree where a large number of businesses are combined and sold to the public, the necessity of meeting outside competition is no longer felt to the same extent, and the incentive

* *Yorkshire Post*, December 2, 1902.
† *Ibid.*, December 3, 1902.

to work the business economically in order to obtain an adequate return upon the capital employed is seriously lessened. Too much reliance is placed upon the possibility of obtaining higher prices; whereas it is, in the case of a public company, of the greatest importance to supervise every item of expenditure, to closely compare the cost of production and distribution with what it was formerly, and to reduce it wherever this can be done with safety."

(2) *Over-capitalization.*—The cases of the Salt Union and the United Alkali Company show the risk of over-valuing monopolist opportunities and patent rights; but the most fertile cause of over-capitalization is goodwill. There is no more disputable point than the proper valuation of goodwill; but it is safe to regard the general British practice as taking it at 3 years' purchase of the annual profits, and to require justification for any higher demand. Of course, in cases where the main value of a business is not in its plant or factories, but in its credit with the public, a greater price is reasonable; thus, Rickett, Cockerell & Co., being retail coal-dealers, got 9½ years' purchase, and the Imperial Tobacco Company, owning a large number of very popular brands, got 8 years'. On the other hand, many of the iron combines asked no money for their goodwill. The Fine Cotton Spinners, the Bradford Dyers, the British Oil and Cake Mills, all asked only 3 years' purchase, the Associated Portland Cement Manufacturers, 2¾ years', and J. & J. Baldwin & Partners, 1½ years'. The English Sewing Cotton Company asked £447,131 for the goodwill of what the vice-chairman afterwards described as "a number of businesses which were confessedly in serious difficulties;" indeed, no profits at all were shown in the prospectus. The Bleachers' Association asked 8 years' purchase for their goodwill, and the public

left the vendors to take up the ordinary shares themselves; their nominal rate of profit will certainly be kept down by this over-valuation. The British Cotton and Wool Dyers also admitted, without much inquiry, a number of concerns of poor standing, but they asked £906,937, or 8·3 years' purchase, for the goodwill. At the annual meeting in May, 1902, the shareholders refused to re-elect the auditors, as, having been concerned in the flotation, they were partly responsible for the over-capitalization; and in November, 1902, the Shareholders' Protection Committee proposed that the vendor's shares should become deferred shares, and should only rank for dividend after the others had received 5 per cent., but this proposal so far has not been accepted by the directors. The Calico Printers also suffer to some extent from over-capitalization, though the amount paid for goodwill was not disclosed, for the profits shown in the prospectus were only enough to pay 4½ per cent. on the total share and loan capital. As for that heavily waterlogged combine, the Yorkshire Woolcombers, it is enough to quote Mr. Henry Ayrton's speech at the annual meeting in August, 1902:—

"The basis on which topmakers' concerns * were bought was 12½ years' purchase of the profits shown to have been made. That means goodwill. It means that the vendor who has sold his business on that basis practically said, 'I will do my utmost, by my own industry, or by deputing others who will carry it on just the same, and for whom I will be responsible, by sending similar wool and taking ordinary business risks in buying wool, just as I did before I sold to the association.' That, I take it, is what is meant and implied by goodwill, and in the contract entered into. Any man

* *I.e.* "topmakers" who sold the combing departments of their businesses.

who fails in that undertaking is like the man who obtains money under false pretences. His goodwill for which he was so heavily paid was worthless."

The negotiations at present being carried on will perhaps result in some of the heavy purchase-money being extracted from the vendors.

Over-valuation of actual assets is far from impossible, especially in industries like steel, where constant reconstruction is necessary to keep works up to date; the extensive rebuilding operations of Dorman, Long & Co., and the Weardale Steel Company illustrate this point. This does not always seem to have been remembered when businesses were bought with the view of closing them, to stop their competition; and the 15 concerns closed by the Calico Printers, the 12 closed by the Cotton and Wool Dyers, and the 11 shut down by the Woolcombers, must have formed no small burden, even after allowing for the transference of the business done to other branches. Messrs. Coats's plan of combining only healthy concerns does not seem to suffer by comparison; the competition of an inefficient can safely be neglected. The Associated Portland Cement Manufacturers valued their active assets at £4,642,000, and raised £930,000 new capital, partly to cover the cost of introducing new methods of manufacture. In the three years preceding the combination, £480,000 had been spent on repairs and renewals out of revenue; £260,000 has since been spent in renewals and in fitting up works with more modern plant, besides heavy sums in acquiring the rotary process patents. It is expected that the improvements will produce a saving of from £80,000 to £100,000 a year; but this raises in an active form the highly technical and disputable question whether the necessity for the introduction of the changes was sufficiently taken into account in valuing the works

taken over. If it was not, there will be trouble in store for the company from this cause.

(3) *Management.*—Some of the British combinations have been slow to learn that to run a huge amalgamation of many businesses is a very different thing from conducting a number of separate concerns, and that a higher order of intellect is not necessarily produced by collecting a score or two of mediocre brains round a green baize table in a board-room. Since the combinations have been engineered by the vendors, we have large boards of directors to represent the interests of the combining firms—this is euphemistically called "putting all the ability in the trade at the disposal of the new company," a desirable object, but not to be attained in this way—and no representation of the interests of the other shareholders. The success of the combination depends entirely on the capacity of the directors; and, if prospectuses be compared with annual reports, it will be seen that the results of the combination agree accurately with the results which the vendors could show in their separate businesses. In this way the collapse of the English Sewing Cotton Company need surprise no one; the directors have made such profusely voluble confessions of their incapacity and of their failure to effect reforms that there is no need to labour this case. The company has now been placed under the tutelage of J. & P. Coats, so that there is some hope of its being rescued from its sad condition.

The Calico Printers' Association affords a spectacle of mismanagement that is likely to become classic; but from the student's point of view that is hardly to be regretted, since in the report of the Investigating Committee—of which the chairman was Mr. Phillippi of J. & P. Coats—we have a short treatise on trust

organization which is exceedingly valuable. It was indeed a sight for the private trader—a mob of 84 directors with no real authority, another mob of 114 vendor-managers who kept on competing with each other out of ignorance or trade jealousy, and custom slipping away while the two mobs raged furiously together. The drastic proposals of the Committee were directed to securing "a central authority, having complete and effective control of all the businesses," and then to put at the disposal of that body "all the information, intelligence, and expert knowledge which can be brought to bear" upon the business of the Association. They recommended that there should be a Board of Directors of six persons, an Executive of two to four members, and seven Advisory Committees of from three to eight members each—adding also that "it is impossible to exercise any useful or even intelligent control, and to obtain satisfactory results" without the establishment of "a statistical department for the purpose of collecting information upon every matter concerning any one of the businesses belonging to the Association, and of furnishing such information at a moment's notice." The Executive were to take part in the Directors' meetings, but without the power to vote; they were to be salaried, and not connected with the management of any branch —in fact, they were to be the statesmen of the Association. The Advisory Committees were to deal with (*a*) works production, (*b*) designs, styles, etc., (*c*) concentration, (*d*) prices, (*e*) trading, (*f*) cloth-buying, and (*g*) drugs, stores, coal, etc., and their members were to be drawn from the ablest officials actively engaged in the business of the several branches. Each week the Executive was to send to the chairman of each Committee "a list of the subjects requiring the attention of his Committee," and one or more members was to be

present at the meetings and "take part in the discussions, reports of which should be sent to the Directors."

"It is intended," said the Report, "that the Advisory Committees shall primarily decide upon the measures necessary to increase the efficiency of the branches, and upon other matters allotted to them; and it will be the duty of the Executive to carry the recommendations of the Advisory Committees into effect. It must, however, not be inferred therefrom that the members of the Executive merely occupy the position of managers, whose duty it is to carry out the instructions of Committees competent to enforce their decisions. They will have the right to decline to adopt any recommendation of the Advisory Committees if they think that it would be hurtful to the interests of the Association to carry it into effect. Should such difference of opinion arise, it shall be submitted to the Board of Directors, whose decision must be final."

The general work of the Board of Directors was to be to *supervise*, of the Executive to *administer*, and of the Committees to *advise*, "whilst co-operating in the general control of the business and directing its policy." To encourage the managers to do their best work the Report pointed out that while commission on profits would work unjustly, "it is necessary to introduce in some form the system of 'payment by results,' and a suitable method of doing so will have to be devised. Men who show originality and ingenuity in designing, or do specially good work in other directions, must be encouraged and rewarded." Finally, the attention of the Executive was directed to the utilization of "the best chemical and mechanical science;" and Sir W. Mather presented a special report urging that "a central department of technical chemistry, applied to calico printing, should at once be established and

equipped with necessary appliances for research and experimental work, conducted by the ablest and best-trained chemists, specially qualified to pursue investigations, in which chemical processes and mechanical and electrical appliances are involved."

The scheme of the Committee is now in force, and we will look forward with keen interest to the results of its working.*

The British Cotton and Wool Dyers have, with good results, instituted a system not unlike the Advisory Committees of the Calico Printers, that is, "weekly meetings of the branch managers in the various sections of the Association's trade, whereby each separate section met and conferred together, and exchanged ideas as to the working of the respective sections."

The present captains of industry have won their fame in the war of competition; and a natural fear is often expressed lest, when competition ceases, there will be no means of training leaders, and that ability will be cramped by routine. The answer is that management must become a science instead of a scramble where the cunningest win. We have already seen the method by which the Calico Printers propose to train their directors by service on Advisory Committees. The Fine Cotton Spinners and Doublers adopt a slightly different plan, somewhat like the now expiring system by which ships' officers are trained as apprentices. To quote Mr. Scott Lings at the Millers' Convention in June, 1901—

"Young men of good family were put into the different works as apprentices. They were there for a year on trial first, and if they liked the work and were themselves liked, an arrangement was made with them, and they had always the inducements before them that they

* The balance brought forward from 1901 was £38,525. The available balance on June 30, 1903, was £379,849.

could rise to the head of the branch; they might afterwards go to the central office and become executive directors, and they might be chairman of the institution at some future time."

Concentration of business by closing small plants and specialization of the remaining works has gone on satisfactorily in most of the combinations; but the making of the necessary adjustments with the minimum of friction is a work of great delicacy, involving much delay and some temporary loss. Centralization of office work, storage, insurance, banking, purchasing, and sales, are other economies usually to be found in operation. The Bradford Coal Merchants' Association has abolished commissions, and the Wall Paper Manufacturers have greatly reduced their staff of travellers. The Imperial Tobacco Company fixes the retail price of its goods, and so long as the public favour for its brands continues it has thus an effective lever for maintaining profits. A very general endeavour can be descried among the different Trusts to attach their customers to them by various inducements. The Imperial Tobacco Company offers a bonus, but the Retailers' Associations are striking out for a guaranteed profit of 20 per cent. on tobaccos and 25 per cent. on cigarettes. This they are trying to enforce by threatening to push the goods of independent firms who have conceded their terms, but their power is small, since buyers ask for their favourite brands and do not trouble about makers so long as the price is all right. The Wall Paper Manufacturers have ten years' agreements with the principal retailers for exclusive supply. The Bradford Dyers attempted to secure their trade by special rebates for exclusive patronage; but now in return for a promise of a first preference in all work they have consented to the institution of a joint committee of themselves and the merchants, the representatives

of the latter being appointed by the Bradford Chamber of Commerce. To this committee all disputes must be referred for final decision, and it consequently has an effective control over prices. The Piece Dyeing Trade Board, to give it its proper name, is an invention of the greatest importance; and as a means of reconciling the interests of manufacturers and merchants it affords a precedent of great value to other industries. It must be pointed out, however, that it gives no protection to the interests of the ultimate consumer, who might be damnified by a decision to put up prices at his expense.

(4) *Raw Materials.*—The strength of a combination depends to no small degree upon its control over the supply of raw materials, and, in fact, the whole tendency of modern trade is in this direction; for example, the English and Scottish Co-operative Wholesale Societies have secured their own tea plantations in Ceylon. At one time the war between the Imperial and American Tobacco Companies threatened to develop into a contest for the control of the tobacco plantations, and the American Company did get possession of the Havana cigar trade, the Imperial Company contenting itself with establishing more direct relations with the tobacco growers by doing their own buying. The difficulties of the Oilcake and Linoleum combines, arising from their lack of control over the supplies of linseed, have already been alluded to. On the other hand, the strength of the Cement Manufacturers and the Bath Stone firms lies in their monopoly of strictly localized raw materials. The case of the iron and steel combines has also been dealt with. The importance of coal in the enhancement or reduction of costs has been well brought out in the last few years. In 1900–01 the British Cotton and Wool Dyers had to pay £15,000 extra for coal alone; the shipping lines in 1901 and

1902 have paid rates from 30 to 50 per cent. above those ruling four or five years ago; and in 1901 the rise in the price of coke from 10*s.* to 22*s.* per ton cost the Associated Portland Cement Manufacturers an additional £200,000, and deprived the shareholders of their dividend. To cope with these difficulties, J. & P. Coats and the Fine Cotton Spinners' Association each own a coalmine; and the Bradford Dyers have a large holding of shares in the Bradford Coal Merchants' Association, with the right to appoint two directors. Similarly J. & P. Coats have invested £100,000 in the Fine Cotton Spinners' Association in order to ensure their supplies of thread. The Metropolitan Amalgamated Waggon Company—a combine arranged only last spring—took over in September, 1902, the Patent Shaft and Axletree Company, partly to absorb their largest competitor in wheel-making, but partly also to be able to manufacture their own channels, their iron and steel. In all these ways we see, to revert to our early simile, the "horizontal" combinations are stretching down "vertically" to get hold of the raw materials. The Cement Manufacturers again are pushing forward the conversion of their works so as to be able, by use of rotary kilns, to use coal, the cheaper material, instead of coke.

(5) *Running short time* is well known to be no economy on account of the persistence of standing charges. It is only specially mentioned here to emphasize its importance in the case of large combinations, where a very great quantity of machinery may have to stand idle, but piling up the dead costs. Thus the British Cotton and Wool Dyers found in 1901, when the weight of wool dyed fell off 25 per cent., that, as the chairman said, "the yarn dyed has cost more in proportion through reasons of this lessened production." To run the mills full is one of the chief

American business principles. President Schwab, of the United States Steel Corporation, told the American Industrial Commission:—

"It is quite true that export prices are made at a very much lower rate than those here; but there is no one who has been a manufacturer for any length of time who will deny that the reason he sold, even at a loss, was to run his works full and steady. . . . We would rather be sure of running our works full at a known loss than not to run them at all."

(6) *Markets.*—Something has already been said about the inability of the trusts to control markets, partly owing to their general lack of control over raw materials, partly owing to the impossibility of influencing great social or political movements. A famine in India, a rebellion in China, are out of our sphere; and the textile amalgamations, with all their millions, have had to suffer from the loss of trade which such events cause. Yet they are really stronger than the separate firms. If they make losses, they are parcelled out among thousands of shareholders, and the combination can go on, so long as it can pay its debenture-holders and avoid a debit balance, when its individual constituents would have been driven into bankruptcy. To this, of course, there is a limit, as the Yorkshire Woolcombers found. Their case, however, is a very peculiar one. The sharp rise in merinos from 21*d.* per pound in 1898 to 33½*d.* in 1899 stifled demand, and was followed by an equally sharp fall to 19½*d.* in 1900. But manufacturers were suspicious, and the heavy influx of cross-bred wools shorn from sheep raised chiefly for their mutton thoroughly disorganized the market. The Australian drought caused the price of fine wools to rise, but coarse cross-breds fell from 12½*d.* in 1899 to 6½*d.* in 1901. At last, with the wet summer of last

year, manufacturers found the opportunity of turning to account the cheap cross-bred wools, causing an increase in price of from 40 to 55 per cent. The future of the wool trade seems to depend upon the extent to which these cheap wools can be utilized, but the Woolcombers have not been able to profit so far by the change in trade, because, according to Mr. Ayrton, the top-makers in the Association have not been loyal, but have sent their wools to be combed by outside firms.

Hostile tariffs have done great injury to the Bradford trades and to the United Alkali Company; but here, again, a combination with a large working capital has an advantage, for it can set up works inside a foreign country, and profit by the tariff. Thus, for example, J. & P. Coats have mills in the United States, the Fine Cotton Spinners have a branch in France, the Wall Paper Manufacturers have recently bought an interest in a German company.

Lastly, when we come to consider the best means of fighting foreign competition in the home and in neutral markets, we find a prevalent conviction that the only effective means is combination among home-producers. To this idea we owe the spread of the movement in the iron and steel industries; and the Imperial Tobacco Company was the direct answer to the assault of the American Tobacco Trust. The result in both cases is convincing. The English company finally won in the tobacco war because it showed that it was able and ready to carry the fight into the enemy's territory. The Wall Paper Manufacturers, again, by their economies in production, have put their home markets beyond reach of attack. And the Associated Cement Manufacturers, though they could not keep up market rates to a paying level against the mass of cement thrown on the market at cut-throat prices by

German firms suffering from over-production at home, still were strong enough to cut their losses by limiting their output and maintaining their own prices.

The future of the trusts as business organizations depends entirely on the manner in which they solve the problem of management. With good management they ought to be able, according to every indication of to-day, to dominate the home market in all large industries, and to make effective headway against foreign competition. But the end of the tobacco war, as well as the formation of the Atlantic shipping combine, shows us that commercial strife may produce a new portent, the international trust. Whether this will make for international solidarity and the millenium, or whether it means the creation of great industrial monopolies outside of and overshadowing mere political organizations, is a question we cannot at present solve. The development will require careful watching, and, if the latter alternative proves the correct one, probably drastic treatment. Sir Robert Giffen would lull us to comfortable slumber by the dictum that there is nothing to fear from trusts in this country. It may be so, but maybe also, "when the sleeper wakes" he will find it different.

THE END

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